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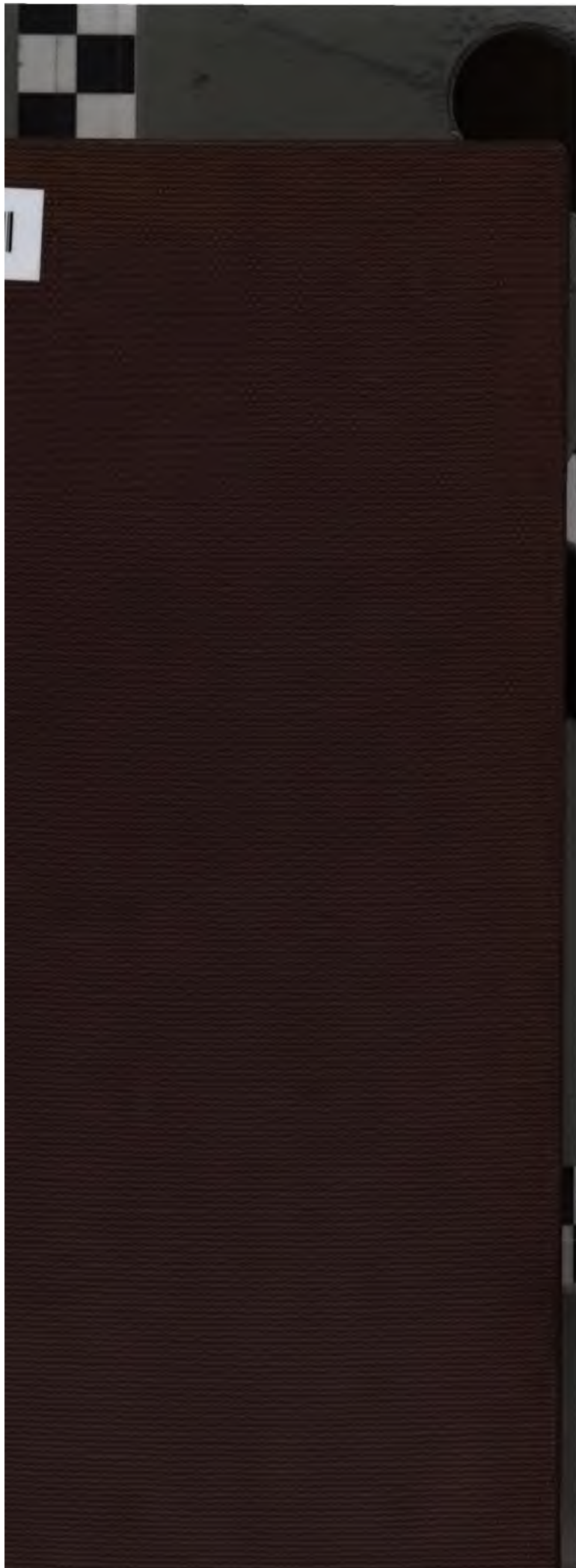
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*Cornelius Walford. F.S.S.*

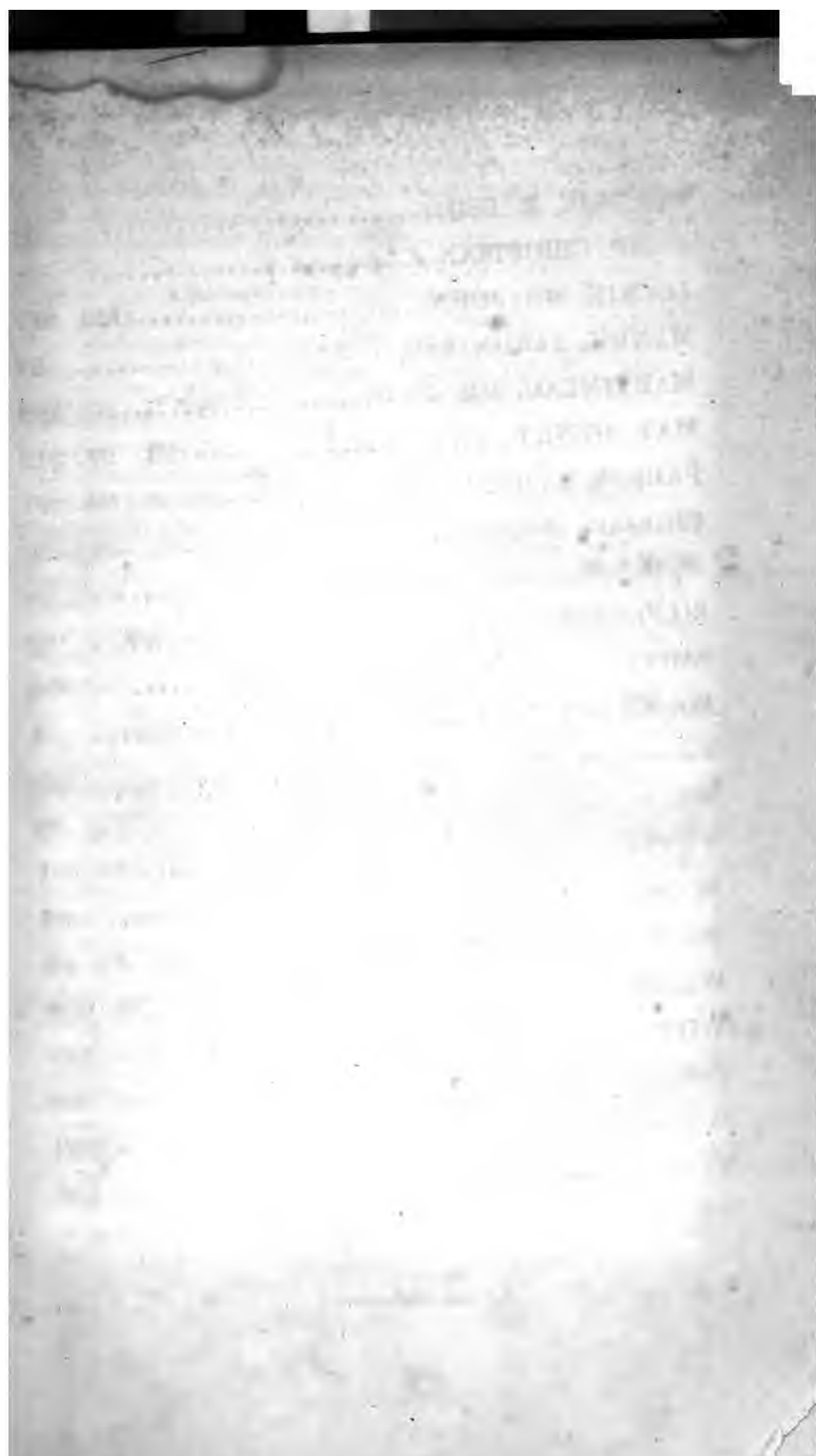
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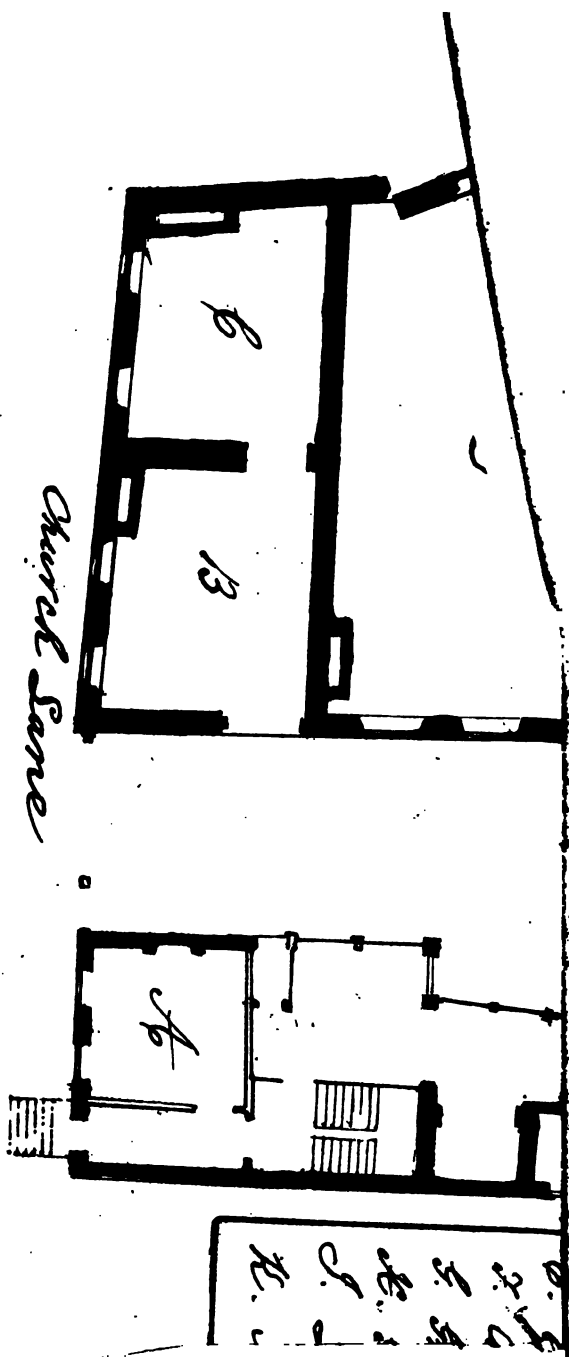
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**A REPORT**  
OF THE  
**TRIAL OF THE ACTION,**

BROUGHT BY  
**MESSRS. SEVERN, KING, AND CO.**  
AGAINST  
**The Imperial Insurance Company:**

BEFORE  
**LORD CHIEF JUSTICE DALLAS,**  
AND  
**A SPECIAL JURY.**  
IN  
**THE COURT OF COMMON PLEAS, AT GUILDHALL,**  
On the 11th, 12th, and 13th Days of April, 1820.

—♦♦♦—  
TAKEN IN SHORT-HAND,  
**BY W. B. GURNEY.**

“Where a loss has occurred, and there is no colour to suspect any unfair practise on the part of the Insured, the Offices ought not to content themselves with being merely just, *they ought to be generous and liberal towards a fair sufferer.*”

MARSHALL ON INSURANCE.

“I agree with the learned Solicitor General in stating, that the Plaintiffs are persons of great respectability, to whom I shall certainly attach *nothing like blame or fraud.*”

MR. SCARLETT'S DEFENCE, P. 99.

**LONDON:**

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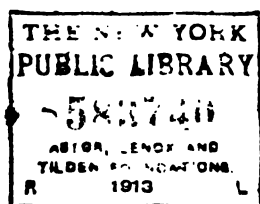
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1820.

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1820

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## PREFACE.



THE great importance of the question involved in this cause, and the interest it has excited in the scientific as well as the commercial world, have led to very numerous enquiries, and an anxious desire to have a distinct statement of the grounds upon which the claim of Messrs. Severn, King, and Co. is resisted. In compliance with a request so reasonable, and in justice to the Assured, who have paid nearly £1000 per ann. to protect themselves from the peril of loss by fire, the following sheets are submitted to the public.

The Insurance Company put in six pleas in answer to the demand made by the Assured, which, with formal replies, constituted what are technically called the issues, and were presented upon the record as follows—

DECLARATION IN COVENANT, on a Policy of Insurance, dated 21st October, 1819, under the seals of the Defendants; reciting that the Plaintiffs, by the style of Severn, King, and Co. of Church-lane, Whitechapel, sugar-refiners, paid £62 12s. to the Imperial Insurance Company, and agreed to pay the sum of £62, on 29th September, 1820; and the like sum yearly, during the continuance of the Policy, for Insurance from loss or damage by fire, not exceeding in each case, the sum or sums thereafter mentioned, on the property thereby described, in the place or places thereafter particularized, and not elsewhere, unless previously allowed by indorsement on that Policy, viz. on the building of their grinding-house and stoves, situate as aforesaid, £3000; on engine-house, £400; engine and utensils therein, £400; mill-work in grinding-house, £1200; stock and utensils in sugar-warehouse, communicating by iron doors only, £3000; the building of dwelling-house and counting-house, detached from the above premises, brick-built, £700; counting-house fixtures, and furniture in counting-house, £200. It was declared and made known, that from the day of the date of the said deed, and so long as the said Assured, should duly pay or cause to be paid, the said premium, to the said Company, at the time aforesaid, and the Acting Directors of the said Company, for the time being, should agree to accept the

791

same, the capital stock or funds of the said Company, should be subject and liable to pay to the said Assured, their heirs, &c.; all the damage and loss which they should suffer by fire, on the property therein mentioned, not exceeding the sum of £8900, according to the tenor of their printed proposals accompanying the said Policy. The conditions contained in the printed proposals, are set out, and which are printed on the Policy.

- AVERMENTS.** 1. That the Plaintiffs paid such premiums to the Company as in the policy in that behalf provided, and that the Acting Directors accepted the same. } This averment is not put in issue by the Defendant's plea.
2. That at the time of the loss the policy was in full force, and that the property of the Plaintiffs in the said policy mentioned, was then duly insured by the said Company, to the amount of the said sum of 8900*l*. } No direct issue upon this, but it must depend upon the validity of the Defendant's pleas.
3. That the Plaintiffs were interested in the property insured to the amount of all the money insured thereon. } Not put in issue.
4. That on the 10th of Nov. 1819, the whole of the property was burnt, consumed, damaged, and destroyed by fire. } An issue upon this.
5. That particulars relating to the said buildings, premises, fixtures, and goods, in compliance with the conditions, were delivered, and taken, and accepted, as sufficient in that behalf, by the said Company and the said Directors, to wit, at the time of effecting the said insurance. } Issue upon the particulars being taken and accepted as sufficient.
6. That the said buildings or goods were not described otherwise than as they really were, so as the same were, or should be, charged at a lower premium than in the said proposals specified as applicable thereto. } The 9th plea puts this averment in issue. The 6th plea also puts it in issue without alleging that the premises were in consequence charged at a lower premium than was applicable thereto.
7. That the buildings did not contain any kiln, furnace, steam-engine, stove, or oven, used in the process of any manufactory whereof mention was not made in the said policy. } Put in issue.

▼

**AVERMENTS.** 8. That no other insurance was made on the said property within the true intent and meaning of the fourth condition. } Not put in issue.

9. That the Plaintiffs did not change their dwelling-house, shop, or warehouse, within the meaning of the sixth condition. } Ditto.

10. That the property insured comprised no such effects or things as are mentioned in the twelfth condition. } Ditto.

11. That the Plaintiffs forthwith, after the loss, gave notice thereof to the Company, and, as soon as possible afterwards, did deliver in as particular an account of their loss as the nature of the case would admit; and were ready to make proof of the same by oath, and to produce such other evidence as the Directors of the said Company might reasonably require. But that the said Company and the Directors thereof, waived and discharged the Plaintiffs from making such proof and producing such evidence and affidavit, as in the condition in that behalf mentioned. } Ditto.

12. That there appeared not, nor was any fraud, false swearing, or affirming, and that the Plaintiffs were always ready to submit all differences and disputes arising, as in the eighth condition mentioned, to the judgment of arbitrators. } Ditto.

13. That the capital, stock, or funds, of the said Company, are sufficient to pay and satisfy the loss. } Ditto.

**2d COUNT.** Sets out policy and conditions, and contains the same averments as in the first count, except that in this count the interest in the goods and fixtures is stated to be in the Plaintiffs, and that Benjamin Severn and Frederick Benjamin King, (two of the Plaintiffs) were interested in the remainder of the property insured. } Not denied by the Defendant's plea.

**3d COUNT.** Recites the policy and the effect of the conditions, with the same averments, and states the interest to be in the Plaintiffs. }

4th COUNT. Precisely the same as the third, but avering the interest as in the second count.

PLEA 1. That the goods, fixtures, buildings, and houses, mentioned in the policy, were not destroyed by fire. } An issue joined upon this.

2. That the loss was not occasioned by any risk included in the policy, but by a mode of boiling sugar by means of heated oil, introduced without any notice to the Defendants, or their consent, whereby their risk under the policy was increased. } Ditto.

3. That at the time of the loss a process of boiling sugar by means of heated oil, had been introduced *into the buildings in the policies mentioned*, without notice or consent, *whereby their risk under the policy was increased*. } Ditto.

4. That the process was carried on at the time the policy was effected, in a certain building called the long-house, otherwise the long sugar house, otherwise the three-span sugar house, communicating with the grinding-house; and although the defendants had notice at the time the policy was effected, that the long-house did so communicate, they had no notice that such process or manufactory was carried on therein, and that their risk was greatly increased thereby. } *Replication.* That the risk or hazard of the Defendants was not increased, by reason of the said process or manufactory of boiling sugar by means of heated oil being carried on before, and at the time of the execution of the said policy of insurance in the said building, in that behalf mentioned, in manner and form as the Defendants have above in that behalf alleged. Issue thereupon.

5. To the first and second counts, that the particulars of the buildings delivered in, were not accepted as sufficient by the Company, or the Directors thereof. } Issue thereon.

6. That the policies in the several counts of the declaration are the same, and not different; and that the policies in the third and last counts mentioned, did refer to the same proposals and conditions as are set forth in the first and second counts; and the Defendants plead to the whole declaration, that protesting the Directors did not accept the particulars relating to the said premises as sufficient, nevertheless that the buildings were not duly described, but were described otherwise than as they really were, contrary to the true intent and meaning of the first and second condition. } Issue thereon.

PLEA 7. To the first and second counts, that the buildings mentioned in the policies contained, at the time of effecting the insurance, a furnace, stove, and oven, used in a manufactory not mentioned in the policy, to wit, in the process of boiling sugar by means of heated oil. } Issue thereon.

8. To the same counts, that at the time of making the policy, the buildings therein mentioned contained three furnaces, three ovens, and a stove, used in the manufactory, viz. in refining sugar, not mentioned in the policy. } Issue thereon.

9. To the third and fourth counts of the declaration, similar to the sixth plea, but alleging, that in consequence of the misdescription, the premises were charged at a lower premium than in the said proposals specified as applicable thereto. } Issue thereon.

10. To the same counts, similar to the seventh plea. } Issue thereon.

11. To the same counts, similar to the eighth plea. } Issue thereon.

Upon the trial the questions involved in the issues were reduced to three points, either of which, the Company contended, would excuse their liability to make good the loss which they admitted had accrued. *First*, that the buildings insured were not properly described in the policy. *Secondly*, that the premises were consumed by the mode adopted of boiling sugar by means of heated oil. And, *Thirdly*, that the risk of the Company was encreased by the introduction of this new process.

These questions were distinctly put by the Lord Chief Justice to a Special Jury, who, to use his own words, "after sitting three days, giving to the cause a "patient attention that never wandered a single instant, "putting questions from time to time, in the result came "to a conclusion that the Plaintiffs were entitled to re- "cover. They called back the witnesses and searched "every part of the case, enquired into the situation of the "buildings, and had the whole under their consideration." And at the instance of his Lordship, and as was required by the form of the pleadings, they stated as their verdict,



First, *That the premises were properly described in the policy.*

Secondly, *That the fire did not take place in the apartment in which the oil apparatus was put.*

Thirdly, *That the risk of the Defendants under the policy was not encreased by means of the new process.*

The Insurance Company, however, were not satisfied with the decision of the Jury, and therefore applied to the Court to send the case down again for a new trial, alledging that the verdict found by the Jury was contrary to all the evidence on the first point, and against the weight of evidence on the second and third points; but the pressure of business before the Court has not enabled the Assured to enter upon the argument, which will necessarily be postponed until November next\*.

It is due to the Jury who tried the cause, to state, that the Lord Chief Justice expressed himself to be "*not in the least dissatisfied with the verdict;*" and that it was his Lordship's opinion, "*that the weight of evidence was greatly against the Defendants.*"

The principal inducement urged by the Defendant's Counsel in his application for a new trial, was, that the Insurance Company were engaged in an extensive course of experiments to discover the nature and properties of oil, with reference to its probable effects; and the Assured will therefore be called upon again to pursue the same course. At present little will be said upon the hardship of compelling private individuals to carry on large and expensive operations, to enable them to compete with several wealthy Companies, agreeing in their opposition to Messrs. Severn, King, and Co.'s demand; it is, however, a matter of most grave consideration, that, even in the event of the Assured's succeeding in every action, the expense of these experiments must be borne by themselves; and it must occur to every thinking mind, that the time of a great number

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\* The Rule was enlarged, and the Defendants are to pay to the Assured £7181. 2s. 6d. the amount of the verdict; to be returned in case the Defendants should set aside the verdict, and ultimately succeed in their defence.

of gentlemen, forming the very highest class of chemical science, cannot be occupied but at a most serious pecuniary sacrifice. This, of course, is exclusive of the heavy amount of law expences.

Nor will the writer, in this stage of the enquiry, offer observations upon the course adopted by the different Insurance Companies, not to abide the event of one cause, fully and fairly tried, but to compel the Assured to proceed to trial against each, and to offer separate grounds of resistance, founded upon the various forms of policies adopted by the different Offices. The Assured cannot anticipate any consequences arising out of such variety of forms, different from those already produced in the cause tried. If, however, the further litigations should shew that the public are seriously prejudiced by legal niceties, introduced into some of the hard conditions, printed in small letters, upon the different policies, and but seldom read by the most cautious assured, a time will come for presenting that subject in a more perspicuous form, for general information.

In the mean time, the writer must believe, that an objection, founded "more upon form than substance," (to use the language of the Lord Chief Justice), and which is "scarcely to be denominated a point or speck in the cause," cannot by possibility defeat the honest claim of Messrs. Severn, King, and Co.; and the present remarks might well be concluded in the words of the same learned person, on the same occasion: "One should expect that the objections which they (the Offices) take, are founded upon liberality and justice; *whether it would become them to resist, on any objection of form, will be for them to consider, and thoroughly consider:*"—It is, however, but justice to the Insurance Company concerned in the proceedings about to be reported, to assume that the Directors have resisted from a sense of duty to their constituents; and it cannot be doubted that the Proprietors would disclaim any little benefit they might individually derive at the expence of the Assured, in a case which, when viewed most favourably for the Insurance Offices, must be considered one of *extreme strict-*

*ness* on their part, and of *extreme hardship* on the part of the Assured. And in order that the writer may not be supposed to offer this sentiment without foundation, he will quote the admission of the leading Counsel for the Imperial Company, who said, *that this was one of those causes in which every body, whose mind is properly constituted, must form a natural wish in favour of a suffering party, and as the Plaintiffs were persons of great respectability, to whom he should certainly attach nothing like blame or fraud, it was quite natural to wish them success in a Cause where they were individual sufferers, and the other parties were more numerous, and spread over a wider surface.*

More cannot be desired for the Assured, than this quotation conveys, and *less* would be to establish a mischievous distinction between plain, obvious justice, and technically legal right.

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**MR. JOHN PHILPOTT, Ditto, Victualler.**



SEVERN, KING, AND COMPANY,  
*VERSUS*  
SLADE AND OTHERS, DIRECTORS  
OF  
THE IMPERIAL INSURANCE COMPANY.

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**REPORT**  
OF THE  
**Proceedings of the Trial,**  
BEFORE  
THE LORD CHIEF JUSTICE DALLAS,  
AND A SPECIAL JURY.

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APRIL 11, 1820.

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**FIRST DAY.**

THE PLEADINGS WERE OPENED BY MR. STEPHEN.

MR. SOLICITOR GENERAL,

May it please your Lordship—Gentlemen of the Jury.

THE plaintiffs in this action, Messrs. Severn, King, and Company, are very extensive sugar refiners, carrying on their business at the works they possess in the neighbourhood of Whitechapel, and the defendants, as has been stated to you, are three of the directors of the IMPERIAL INSURANCE OFFICE. This action has been brought for the purpose of recovering the sum of about eight thousand pounds, part of the very large sum of 70,000*l.*, which is the amount of a loss they have sustained by the destruction of the greater part of their premises, by fire, in the month of November, 1819.

Gentlemen, there is no dispute with respect to the loss which has been sustained, either with respect to the extent of loss, or the interest of the plaintiffs,—there has been no imputation attempted to be cast on the conduct of the plaintiffs on this occasion; but the defendants conceive, that on some points of law, or in consequence of some irregularity in the policies, they are not liable to make good this loss; and it will be for you, after you have heard the evidence I shall lay before you, to determine whether or not the defendants are liable for the loss which they have insured. It will be a grievous misfortune, Gentlemen, for the plaintiffs, if they are not entitled to recover, more particularly as they have paid a most enormous rate of insurance for the security

separated from the insured premises by a party wall, or that which is considered equivalent to a party wall—a party wall communicating solely by an iron door. Gentlemen, I have already stated to you that the grinding-house is the part to which your attention will be principally directed; the process complained of was not introduced in the grinding-house, but it was introduced in the fill-house of the long house, which is not insured in the present policy, which is separated from the grinding-house by means of a party wall, built according to the restrictions of the building act, and communicating solely by an iron door, so as to be considered, under the building act, as a separate and entire building; and one question will be, whether, whatever communication it might be necessary to make when the policy was effected, with respect to the actual situation and state of the premises insured, and the nature of the works, and the processes there carried on, whether it was incumbent upon these parties who were insured, to describe all the adjoining premises, and the various processes used in them; or whether it was not incumbent upon the present defendants, if they were desirous of that information, to make the enquiry, and then, if such enquiry had been made, and any false representation had been given by my clients, I admit the policy would have been vitiated: but I contend, and I think I shall contend successfully, even supposing it can be shewn that this was a new process, and attended with an increased risk, that, still being carried on, not on the premises insured, but in adjoining premises, it was not incumbent upon my clients, in the first instance, to go to the insurance-office, and to describe the process so carried on in another building; always, however, with this reservation, that if the insurance-office had thought proper to make any enquiry upon the subject, then, in point of honour, and faith, and good conduct, it would have been the duty of my clients to have made a full and fair representation on the subject.

Gentlemen, before we proceed further into the consideration of this case, it will be necessary for me to state to you, that the modes in which the sugar refining is carried on, are as various as the different establishments in which it is conducted; there are scarcely two establishments in which it is carried on in the same way; And if that be so, then it is incumbent upon those parties who are insuring, if they wish to know what particular process is made use of, (for I am now abandoning, for the moment, the argument arising out of its being carried on in another, and not the same, building) —I say, Gentlemen, inasmuch as the modes of boiling sugar,

for the purpose of refining it, are as various as the establishments in which it is carried on, it is the duty of the Underwriters, if they wish for information as to the particular process adopted, to make the enquiry themselves; and it is not necessary for the party effecting the insurance, to do more than to say, "I wish an insurance to be effected upon my sugar-refining establishment." If the Underwriters wish to know in what mode that sugar refining is carried on, inasmuch as the modes are various, it is for them to make the enquiry; and when such enquiry is made, I admit, as I have done before, a full, a fair, and an honest account must be given.

Gentlemen, when I mention that there are so many modes of conducting this process, I shall take leave to point out to you some of the means by which this is done. Formerly, the simple method was used, merely of putting the sugar into the pan, and applying the fire underneath: that was productive of great inconvenience, particularly this, that inasmuch as the fire communicated more rapidly to the sugar next to it, than it would to the remainder, that part of the syrup near the fire became burnt, before the other was reduced into an equal state of boiling. In consequence of this, scientific men resorted to various methods: one method was that of heating water, and passing the steam through coils of pipes, into the body of the syrup to be heated; but it was found that that mode would not answer, for this reason, that the sugar would not boil at the same temperature as water boils, and, consequently, that that would not bring the syrup into a state of boiling: it became necessary, therefore, to add high pressure to it, and though by that great risk was incurred, yet sugar refining was carried on, in some manufactories, by high pressure steam. For the purpose of avoiding this, Mr. Howard, I believe, devised another method. You are aware that fluids will boil at a lower temperature in vacuo, than they will in the open air. Mr. Howard took off the pressure of the atmosphere, and then, by surrounding the pan with steam of the ordinary temperature, the syrup was boiled. Another method, practised in Liverpool, was by making use of tallow:—a quantity of tallow was put into a pan immediately over the fire—this requires a much greater heat to put it into a boiling state than sugar, and the sugar being put into a pan immersed in it, was boiled at a temperature which did not affect the tallow.

Gentlemen, this brings me, then, to the particular process which is to be the subject of your consideration. It was found very inconvenient to boil sugar by means of tallow, in an open vessel, as the smell was offensive; the workmen



could not bear it, and it was offensive to the whole neighbourhood. For the purpose, therefore, of obviating that objection, Mr. Wilson, a witness whom I shall call, introduced a method of using, instead of tallow, whale oil: this was put in a vessel over the fire, and a coil, or worm, communicating with this, passed into the pan containing the sugar to be boiled, and heat being applied to the oil in the vessel, it was circulated through the worm by means of a pump, and communicated heat to the sugar in the pan. In order to put oil into a boiling state, it requires a temperature of  $600^{\circ}$ ; now, sugar boils at a temperature of  $240^{\circ}$ , and the sugar, therefore, was boiled without boiling the oil, or incurring any of the risks which might result from that operation, and at a temperature below that at which any risk could by possibility arise. This is the particular process to which your attention is to be directed, and the first question is, whether it was necessary that any communication should have been made to the office, that this particular process was used, in a pan, in adjoining premises. The next question is, whether, if it was not necessary to make the communication, the allegations put upon this record can be made out, viz. that this produces an increased risk. I shall demonstrate to you, by the clearest possible evidence, that it cannot; and the next, that the loss was occasioned by this, I shall also negative by the clearest possible evidence.

Now, Gentlemen, when they talk of an increased risk being occasioned by this process, it must be an increased risk compared with the old mode. A model has been prepared of the apparatus as it existed before the fire, and that will explain the matter much clearer than any words by which I can express it. [*The model was opened to the view of the Jury*]. Gentlemen, that model before you will, with a very few words on my part, explain to you, with the utmost possible distinctness, the real question in issue between these parties. Gentlemen, you perceive the copper pan on the side nearest to you, that is the pan in which the sugar is placed; and you perceive a small door belonging to the fireplace below it. Disencumber your minds of every thing except that copper and the furnace to which I am now directing your attention, and you will there have the ordinary process of boiling sugar:—the sugar is put into the copper, and the fire is put under it, and it is boiled. Now, the inconvenience resulting from that is, what I have already explained to you with respect to the communication of heat; but there is another inconvenience, which is, that if it by any accident boils over, the premises are invariably consumed:—

there is not a person acquainted with the subject but who will tell you, that if it is suffered to boil over, the premises are infallibly burnt; that is, if the sugar is suffered to get to a temperature above  $250^{\circ}$ , or  $260^{\circ}$ , it will boil over; it must go into the furnace, or the ash-pit beneath it, and, in either case, it sets fire to the premises. In the new process, Gentlemen, there is no furnace under the pan; but, at a short distance, there is a fire-place, and over that a wrought iron vessel filled with fixed oil, which will not boil at a temperature under  $600^{\circ}$ , or  $650^{\circ}$ . From this vessel there is a copper pipe goes up to a pump, and from that pump it descends again into the copper pan; it makes some coils in the pan, and the other extremity of it again returns into the iron vessel. Gentlemen, you will perceive upon the top of that vessel a thermometer, which is graduated to only  $450^{\circ}$ , and if the oil gets to a temperature beyond  $450^{\circ}$ , that thermometer would burst, consequently it would be in a moment discovered. That is greatly below the boiling point of the oil, and as soon as it gets to a temperature of  $350^{\circ}$ , the pump is set to work in the warehouse above, and by pumping there, the oil is drawn from the vessel into the pipes, it goes into the copper pan, and from the copper pan returns again, like the circulation of the blood, into the iron vessel. This heated oil passing, in this way, through the fluid sugar, boils the syrup, and that at a temperature very far, indeed, below the boiling point of oil, so that there is no possible risk in the process. Objections have been raised on the other side, and it is necessary for me to notice some of the objections which have been thrown out, because one does not come into a Court of Justice to try a question of this kind, which has been agitated between the parties, and on which scientific men have been questioned on both sides, without being in some measure aware of the points which will be made on the other side; I will therefore introduce them to you, though in language less scientific than that of the witnesses who will be called.

Gentlemen, it is said the pipes may burst: the very short answer to that is, that the valves in the pump through which the oil passes, are much smaller than the diameter of the pipes themselves; and if that objection should be made, that is a complete, short, and distinct answer to it. Again, it is supposed that gas may be created, and that that will be productive of danger. Upon that point I have to state to you again, that gas is not created by heated oil until it gets to the temperature of boiling, or above the temperature of boiling; and no gas will therefore be created by fixed oil

until it is at the temperature of  $600^{\circ}$ . I have gentlemen in my eye, round the table now, who will prove to you that this is so; and unless, therefore, the oil gets up to a temperature far beyond that at which the thermometer will have exploded, and the most extraordinary appearances be shewn, it is impossible that gas can be generated: and I understand that the fire must be continued not one, two, three, or four hours, but with an intensity almost incredible, for a very long period of time, to bring the oil to this degree of heat; for after you get up to a certain temperature, the increase of temperature becomes very slow indeed: when it gets to a certain point it becomes almost stationary, unless it is increased by an immense accumulation of heat, and that continued intensely for a very long period of time. It is therefore impossible, in the manner in which this process is carried on, that any gas could be created by the oil; but admitting, for a moment, that this is possible, What is the effect to be produced by it? Where is it to be conveyed to? There is but one communication with the vessel and the external air, and it was necessary there should be some; for as the vessel was not filled with oil, there would naturally be air in it, and in the pipes; it was therefore necessary there should be some mode of conveying off that air, which would be expanded by the action of the heat, and require a larger space, and therefore there was a pipe fixed in the vessel, which passes up a flue called the steam vent, and which you see, in the model, coming out at the top of the section of the chimney. Now, if any gas were created in the oil vessel, the only mode in which the gas could escape, would be through that pipe. What is the consequence?—that is above the second floor—it is impossible, therefore, that it could come into the buildings but it must pass up that flue, and go out at the top of the chimney.

But, Gentlemen, I understand that it is intended to be said, that it will still come into the buildings below, for though its specific gravity would naturally lead it upwards, it may, by a sudden draft, be driven downwards; but you will observe that that is impossible from the construction of the house. You know, in the ordinary way of heating a house, the air which comes into a room, through the door, and other apertures, feeds the fire, and preserves it from going out. If you put your hand to the chinks of the door, you will feel that the air rushes in, but these furnaces are not fed from the air flowing in from the warehouses, as that would create a current so strong, as to unfit it for the purposes of the manufactory. If you allowed the warm air to be continually passing out

to supply the fires, the consequence would be, you would lose that heat, which is of the greatest importance; and for the purpose of obviating that, at the back of the fire-place there is a large communication with the external air. The fire is fed entirely from this external opening, without any draft from the room; the consequence is, that there can be no draft downwards; and to supply the place of the air consumed in the fires, there is a very strong draft up the chimnies, from the external air; and as the air of the room is very much heated, there is a very strong current setting up the steam vents, which run up by the sides of the chimnies, and into which this pipe, which would convey any gas that might be generated, passes. Again, Gentlemen, with respect to this gas, I am told that if gas did get into the room, the gas that would be produced, by possibility in any ordinary time, by all the oil contained in that vessel, if all the industry and means possible were applied for that purpose, would not bear such a proportion to the atmospheric air, as by the application of fire to produce an explosion. Gentlemen, this is not upon a nice admeasurement, for the quantity of gas which could be generated, falls so far short of the quantity required for it, that it cannot produce that effect. I say this not on my own authority, but it is the judgment of persons on whom the public must rely, because they have passed all their lives laboriously and actively in the pursuit of these studies.

But, Gentlemen, I understand it will be said that the nature and character of the oil, may, by degrees, be changed by the continued application of heat; that though it may not emit gas at a certain temperature, to-day or to-morrow, it may, after a period of time, so far change its quality and character, that the same effects will be produced at a temperature of 300° or 400°, which, on new oil, would require a heat of from 600° to 700°. Now, Gentlemen, I am told that that is not the fact; we have persons now in Court, who have made use of oil for a period of two years together, and who will tell you that the only effect upon it, is the rendering it somewhat thicker, and more viscid, but that it is again rendered fluid by the application of heat. But even if that could be the effect, under certain circumstances, in this case it would be put out of the question; for we shall prove to you, that the oil had very recently been taken out of the vessel and examined, and found to be good. Again, it is said that the oil vessel may leak, and the oil drop into the fire, and thus an accident be occasioned; this, again, I am told, is a fallacy; for I am informed that no accident could happen, in the way in which this vessel was

placed, in consequence of any dropping from the bottom of that vessel into the fire; and, in fact, it has at different times leaked—the oil which dropped into the fire, has become inflamed, and has passed up the chimney; and when, on one occasion, it leaked to a greater extent, it put the fire out: and only three or four days before this took place, the oil vessel was taken off, and every kind of leakage stopped, so that I apprehend you will find there is nothing in that objection.

Gentlemen, these are all the observations and objections which I shall anticipate: with respect to the increase of the risk, I undertake, as far as the opinions of scientific men can have weight, to demonstrate to you that the risk is much less in this mode, than by the ordinary mode of boiling it in open pans; and I think the thing speaks for itself, and that it is requisite only to look to the apparatus, and to understand the ordinary mode of conducting the process, to see that it must be so.

Gentlemen, I am reminded of one thing, which also is very material. I directed your attention to the copper pan through which the worms pass, and which was used as a sugar pan before this process was adopted. There was another pan in this situation, at present occupied by the oil vessel, heated precisely as the pan which now remains was formerly heated, so that this is a substitution for another pan; but this substitution for another pan had taken place before the policy was effected, above five months, and any person walking into the premises might know it; whether it was known to the Directors of this office, I do not know, but it was to the Directors of another, and to their surveyor, and they have made no objection.

But, Gentlemen, this is alledged to be the cause of the fire; now it will be necessary for me to direct your attention to the facts which occurred. At three in the morning, a man gets up and lights the fire under the oil vessel, and the man who keeps the steam-engine also gets up and lights the fire under the steam-engine next to the grinding-house. The moment the fire has got to such a height, and the oil is heated to such a degree, as to make it convenient to pass it into the sugar, the steam-engine is put to the pump, and the work begins at three o'clock in the morning the fire was lighted as usual, at half past three the person who keeps the steam-engine went to the head of the stairs to ask the person below whether he was ready to have the engine put on; he said, "Not yet." It is clear, therefore, that it was not then at the heat of 350°: a few minutes afterwards, he again went to the spot, and asked whether he was ready, he said, "Directly:" upon

which the engine-keeper went back and put the pump on; he then went about some other work, and, in about a quarter of an hour afterwards, he heard that the premises were on fire; he immediately went and looked into the warehouse over the fill-house, and he saw, to the left of the door, a quantity of fire on the floor spreading rapidly. Now, Gentlemen, I must explain to you the purpose to which the warehouse is applied; it is applied to the packing of sugar, and to the throwing sugar out of the hogsheads: there is a quantity of straw, and of other combustible materials, on the floor, and the planks are so dry, that a very slight thing will put them into a state of ignition, and the quantity of sugar about will increase the risk. It is not necessary for me to account for the fire, it is frequently very difficult to do so, but it is very easily accounted for by these circumstances. The engine-keeper having observed this fire, immediately shut the iron door, and ran away for help, and another man came in; that other man who came in, went through the grinding-house, and immediately to the iron door communicating to the warehouse, the iron door was shut. He heard a great crackling, and the door was getting very warm; he then went down stairs to the cellar below the grinding-house, and tried the iron door in the fill-house, and found it was closed; he listened, but heard no noise there, and the door was not warm; it is perfectly clear, therefore, that the fire was then in the upper, and not in the lower room. He attempted to go into the new sugar-house warehouse, which communicates by an iron door with the long-house warehouse, and looking through the chinks of this door, he saw the fire in the long-house warehouse: it was with difficulty that he could get into this room, but he crawled on his hands and knees, and he afterwards went into the fill-house below, which also communicates with the fill-house of the long-house; and in the latter fill-house, looking up to the timber, he saw the planks of the ceiling burning through, as if the fire was just beginning to penetrate from the warehouse above. Upon this there was a general alarm, and no further particulars could be gained. I think, from these circumstances, you must be satisfied that the fire did not commence in the fill-house, but in the warehouse, and that it cannot, therefore, be supposed to have had any connection with this process.

Gentlemen, this became the subject of investigation; and it was most material, as it was suggested by the agents of the office, that this might have been occasioned by some explosion of the machinery, to dig in the ruins to ascertain the state of the apparatus used in this new process; and the observations made at the time, led every one to believe that

the fire had commenced in the warehouse above ; nor was there any reason to suppose it had arisen from this apparatus. It was material to confirm this by the inspection of the apparatus after the fire ; and on removing the rubbish, the oil vessel presented precisely the appearance it had before. There was no rent in it, and the only injury it had sustained was, that it was slightly compressed at the top by the weight of the substances upon it. Another most material circumstance to shew that the oil vessel had no connection with the fire, was this : if the fire had commenced by means of the oil, its action would have been most violent at that part ; but so far was this from being the case, that even the screws used to secure the covering to what is called the manhole, and which is a hole in the upper part of the oil vessel, for the purpose of supplying it with oil or clearing it out, were found bright and perfect, and at the time were unscrewed. Now, had there been a violent action of fire in that place, the screws would have fused, and have become united with the socket, so as to have rendered it impossible to unscrew them. But, Gentlemen, that was not all : it was observed that there was a great accumulation of broken pots, which had fallen down from the floors above ; and it is extraordinary, that though this mass of pots was much fused at the top, as you went down that fusion was gradually lessened, so that it is manifest, that the intensity of the fire was above, and not below. Gentlemen, in addition to that, the pipe which conveyed the oil from the vessel to the pump was not fused at all, but the pump above was entirely in a state of fusion. I shall call Mr. Donkin, and a number of other surveyors, who will state their belief that the fire certainly had not commenced below, but above. Gentlemen, there is another circumstance which I shall mention, for the purpose of explaining ; it is said the copper pan was melted. The reason was this : in order to obviate the draft under that pan, the fire-place had been completely filled with coals, and these having taken fire, would naturally act upon the copper pan ; therefore, no inference can be drawn from that circumstance.

On examining the oil vessel, Gentlemen, it was found that the oil in it had been distilled, and that a carbonaceous matter remained in the vessel ; the heat of the fire had been such as entirely to distil the oil, but there was no indication of that extraordinary operation or explosion to which the fire is attributed by the gentlemen on the other side. The vessel was examined, to ascertain whether there was any leak in it, and water was put into it and boiled in it for that purpose ; the only defect in it was a fissure in the top, from some

melted copper which had fallen on it in a state of fusion, and found its way through the iron.

All the gentlemen whom I shall call to you, the most competent in the world to come to a right conclusion on this subject, will tell you, that they are satisfied the fire did not originate with the oil vessel. You will find that there is an absolute impossibility, or at least a moral impossibility, of the accident having originated from this process; and you have these circumstances confirmed by the facts of the state in which the apparatus was found after the fire. If you can fairly and satisfactorily come to this conclusion, I am sure you will be extremely happy that these gentlemen, after having paid so large a premium, shall not, by the non-communication of this particular and unimportant fact, sustain this large and immense loss, which would otherwise fall upon them individually.

**LORD CHIEF JUSTICE DALLAS.**—Is this process peculiar to this sugar house?

**MR. SOLICITOR GENERAL.**—No, my lord. I have just been reminded that I have not stated that this process of boiling by oil had been in use before, and that the Imperial Office had themselves insured a sugar refinery at Liverpool, where it was carried on, and that one of the present defendants is on the policy.

**LORD CHIEF JUSTICE DALLAS.**—Mr. Scarlett, is there any other point to which you wish that my attention should be directed, than those which have been adverted to by the Solicitor General. I have taken them down thus:—First, “Was the fire occasioned by this process;” if so, secondly, “Were the plaintiffs bound to communicate it.” Thirdly, “If not occasioned by this process, were they still bound to communicate it?” Fourthly, “Did the process increase the risk?” Fifthly, “Does it make any difference that it was not on those premises on which the fire began, but on other premises?”

**MR. SCARLETT.**—That last question does not arise on these pleadings. There is another objection, that the description of the premises was not properly given:—on that the Solicitor General has not said any thing.

**MR. SOLICITOR GENERAL.**—Not satisfactorily given, so as to shew the increase of the risk, and “so as the same were charged at a lower rate of premium.”

**MR. SERJEANT HULLOCK.**—No: those words were struck out.

**LORD CHIEF JUSTICE DALLAS.**—What count is that?

**MR. SERJEANT HULLOCK.**—The sixth plea, my lord.



MR. SERJEANT TADDY.—The words are these: “that the buildings in the said deeds, poll, or policies of insurance, in the declaration mentioned, were not duly described; but the same were described in the said deeds, poll, or policies, otherwise than as they really were, contrary to the true intent and meaning, &c.”

MR. SERJEANT HULLOCK.—There is nothing about “so as” in that plea. I do not know whether your lordship has an abstract of those pleas.

LORD CHIEF JUSTICE DALLAS.—Yes, I have. The words are, “that the buildings were not duly described: but described otherwise than they really were.”

MR. SERJEANT HULLOCK.—Just so, my lord; the issue is joined on the terms of this plea.

MR. SERJEANT TADDY.—That plea it will be necessary for us to watch, because there is a good deal connected with it, “contrary to the true intent and meaning of the said first and second conditions contained in the said printed proposals.”

MR. SOLICITOR GENERAL.—Those conditions, my lord, relate to the payment of the annual premium on “common insurance, hazardous insurance, and doubly hazardous insurance. They are as follows: “In the insurance of goods, wares, or merchandizes, the buildings, or place in which the same are deposited, is to be described; it must also be stated whether such goods are of the kinds denominated hazardous, and whether any manufactory is carried on in the premises. And if any person or persons shall insure his or their buildings or goods,” these are the words, “and shall cause the same to be described in the policy *otherwise than as they really are, so as the same be charged at a lower premium than is herein specified as applicable thereto*, such insurance shall be void;” but our insurance is not on any of those conditions, but is at a higher rate.

LORD CHIEF JUSTICE DALLAS.—I understood you to say doubly hazardous is 5s.; this is 14s.

MR. SCARLETT.—It is right my learned friends should state their own case in their own way! when I come to mine, I will state it myself. I generally find this cross fire comes to nothing: your lordship will find it has nothing to do with hazardous or doubly hazardous.

LORD CHIEF JUSTICE DALLAS.—I only wished to know what were the points. I now see sufficiently for us to understand the evidence as it is given.

**EVIDENCE FOR THE PLAINTIFFS.**

*Mr. Serjeant Lens.*—We will put in, for form's sake, the policy and the admission of the loss; there is a receipt for the year: it was a very short time after the effecting of the policy that the fire happened.

**GEORGE DUKE Sworn.**

*Examined by Mr. SERJEANT LENS.*

*Quest.* I believe you are a millwright? *Ans.* Yes.

*Q.* You were employed as such in these works of Messrs. Severn, King, and Co.? *A.* Yes.

*Q.* How long had you been in their employ superintending these works? *A.* About three years.

*Q.* You were in that capacity at the time when this fire happened? *A.* Yes.

*Q.* Do you recollect, in the early part of November, particularly the 9th of November, the fire happening on the night of the 9th, and between that and the 10th? *A.* Yes.

*Q.* On the evening before, how late had you been upon the premises? *A.* Half past eight o'clock.

*Q.* Had you any thing particular to do?

*A.* I had a job in the engine-house, repairing the sun wheel.

*Q.* Had you repaired that wheel when you went away?

*A.* Yes.

*Q.* Before you went, did you observe whether there were any men remaining still at work?

*A.* I left the engineer in the engine-house.

*Q.* Was he the only person that was left?

*A.* I believe he was the last that I left.

*Q.* Was that a person of the name of May? *A.* Yes.

*Q.* Whereabouts is the fill-house situated?

*A.* It is the very lowest part of all.

*Q.* Is it called the fill-house from filling the pans there?

*A.* I really do not know.

*Q.* Where is what is called the warehouse?

*A.* In the next floor above.

*Q.* Is it immediately over the fill-house, as well as the next floor above? *A.* Yes it is.

*Q.* What time the next morning did you come to the premises? *A.* About seven o'clock.

*Q.* When you came there the fire had broken out a considerable time?

*A.* Yes, it was burnt nearly to the ground.

*Q.* Are you acquainted with this oil apparatus?

*A.* Yes, I have worked a little at it.

Q. Do you remember the time when the work was by the pans in the ordinary way?

A. Yes, I was on the premises at the time.

Mr. Scarlett.—We shall not differ about the time; when was it?

Mr. Serjeant Lens.—April, I am told.

A. It had been worked about three months.

Mr. Scarlett.—We understood it had been introduced about August.

Mr. Serjeant Lens.—How long had it been in work?

A. I think it began about the middle of August.

Q. Before that, was the working by pans in use?

A. Yes.

Q. Look at the model before you, does that represent the pan as it was used? A. Yes, taking the worms out.

Q. The worms were not introduced for the mere working in the pan? A. No.

Q. They belong to the other apparatus? A. Yes.

Q. When the pan was used without the worm, where was the fire placed that was to operate upon the pan?

A. In this place, [*pointing to the fire-place under the pan, in the model.*]

Q. The fire actually under it, like an ordinary pan?

A. Yes.

Q. When the worm was used in the pan, the fire under it was not used? A. No.

Q. Then after the other process came into operation, that was shut up? A. Yes.

Q. That was closed as it is now? A. Yes.

Q. On the right hand side you see a place in which the oil is enclosed, with a covering like the tilt of a waggon; is the body of the oil in that place?

A. It is in the inside of that vessel.

Q. What kind of oil was actually put there?

A. Lamp oil.

Q. Is it whale oil?

A. I believe it is.

Q. Is the body of the oil heated for the process, kept in that vessel you see before you?

A. It is kept in that vessel.

Q. When the oil is to be heated, how is that to be done?

A. By the fire which is underneath it.

Q. Is that a smaller or a larger fire-place than the former fire which used to be underneath?

A. I believe it is rather smaller of the two.

Q. There is rather less fire consumed under the oil, than used to be under the pan?

A. Yes, considerably less fire will do.

Q. What was actually used? and was the fire-place employed there somewhat less, or much less? A. It was less.

Q. It was upon the whole rather less? A. Yes.

Q. Is the oil heated to a certain degree before it is begun to be carried by the pump through the pipe? A. Yes.

Q. What is the heat to which it is carried?

A. From 320° to 350°.

Q. Is it then in a fit state to begin working. A. Yes.

Q. How does the working begin when the oil is raised to 320° to 350°?

A. The pump is set on, and by the suction the oil is drawn up to this tube.

Q. Then it is carried to other tubes? A. Yes.

*Mr. Scarlett.*—It is carried by this sort of process through a worm, so as to multiply the space affected by it.

*Mr. Serjeant Lens.*—Just so, the pumping having begun when the oil is at 320° to 350°, what is the immediate effect; is the heat of the oil increased or decreased?

A. It is decreased.

Q. The sugar is at that time cold? A. Yes.

Q. Does the heat then go on, and is the pumping of the oil carried on until the heat is communicated to the sugar sufficient for the purpose of boiling the sugar?

A. Yes, they carry it on till the oil comes up to the same heat again, and then they continue it regularly, and the heat does not increase.

Q. Is it carried on for the purpose of making the sugar boil? A. Yes.

Q. Is that the way in which, generally speaking, the sugar is boiled? A. Yes.

Q. Then every thing going regularly on in the ordinary way, this process is continued for the purpose of making the sugar boil, and the sugar is made to boil by it?

A. It will boil very well at that heat.

Q. In what way is the pump supplied?

A. There is a copper pipe that runs up from the oil vessel.

Q. Where does it come down to, nearly to the bottom of the oil in the vessel? A. No, I think not.

Q. Perhaps we had better take that by another witness. Is the sugar usually packed in the warehouse?

A. Yes, always.

Q. Is there upon the floor of the warehouse always a quantity of sugar? A. Yes, a considerable quantity sometimes.

Q. Are the empty hogsheds there? A. Yes.

Q. Do they remain there till it is convenient to take them away? A. Yes.

Q. Is there a quantity of straw there?

A. Yes, paper and straw a considerable quantity.

Q. Is that the case ordinarily?

A. Yes, I believe it is generally so.

*Mr. Scarlett.*—He says, he believes it was; perhaps you had better ask another witness that?

*Mr. Serjeant Lens.*—Was there any difference at that time?

A. I know they had packed twenty hogsheds two days before, and I believe it was in the same state in which it usually was.

Q. And there is ordinarily straw and hogsheds, and so on, about? A. Yes.

*Mr. Scarlett.*—You had better not lead him in that way.

*Mr. Serjeant Lens.*—Oh, that is not leading; but I will ask, Is that the ordinary way? A. Yes, it is.

Q. Generally speaking, did you attend to the description that has been given of the model? A. Yes.

Q. Is that model a correct description of the premises?

A. I believe it is.

Q. Did you attend to the description that has been given of the thing? A. Yes.

Q. Is the account which has been given, and the use to be made of it, correct?

A. Yes, this is exactly as it was before the fire.

Q. Are there any pipes behind from the street?

A. Yes, there is a flue for the free air to come in.

Q. There is a leaden pipe goes up into the steam vent from the oil vessel, I believe? A. Yes.

Q. How high above the fill-house and the floor, does it come in up the steam vent. I mean, where does it commence?

A. I believe it is sixteen feet above the fill-house.

*Mr. Scarlett.*—This is the steam vent, if I understand it?

A. Yes, it is.

*Mr. Serjeant Lens.*—Does that communicate with the open air? A. It goes right up the house.

Q. So that it goes immediately to the open air? A. Yes.

Q. That steam vent beginning as you describe, goes up, and communicates with the open air? A. Yes.

Q. Does it come out by the side, or does it come up?

A. It goes up exactly like the model.

*Mr. Scarlett.*—Like a sort of window? A. Yes.

*Mr. Serjeant Lens.*—In what sort of work is that vessel containing the oil, placed? A. Brick-work.

Q. What thickness is that? A. Four inches.

Q. Had you, two or three days before, had occasion to examine that brick-work, or that apparatus?

A. Yes, we took it right out, and turned it up.

Q. How shortly before.

A. I believe it had worked four days after it was taken out.

Q. What occasioned the taking it out?

A. There was a little leakage through the rivets.

Q. Was that leakage cured by the rivets being put into their proper condition? A. Yes.

Q. Had you observed any leakage after that?

A. Only a drop or two, now and then, from the vessel, fell into the fire.

Q. Had that thing occurred before in greater quantities?

A. It did leak before.

Q. What becomes of that?

A. It rather flashes, but all the flame goes up the chimney.

Q. You described one or two small drops that fell in after this mending of the rivets? A. Yes.

Q. Did that go up the chimney after the flashing?

A. It all vanished up the chimney.

Q. Did any effects remain? A. Not that ever I saw.

Q. Do you recollect, as this oil vessel came to be fixed in that particular place, was there any attention paid to where it would be most convenient to place it? But I will not go into that, that relates to another matter, to the other case.

*Mr. Solicitor General.*—We happen to have three policies.

*Mr. Serjeant Lens.*—There is a doubt whether that would be strictly evidence here. Generally speaking, were you able to observe any mischief, or cause of danger, or any thing which struck you particularly on it, or did every thing go on well?

A. It went on very well; I never saw the least danger.

Q. As to the management of it, was it easily managed?

A. Very easily.

*Cross-examined by Mr. SCARLETT.*

Q. I understand you are a millwright? A. Yes.

Q. It was not your business to attend that fire, was it?

A. I never did attend to that fire.

Q. I suppose there was some man whose business it was to attend to that fire? A. Yes.

Q. What is his name? A. Miller, or Muller.

Q. He is alive, is not he? A. Yes.

Q. Then, when you speak to the fact of the mode of making the fire, is that what Muller has told you?

A. No, I have seen it done.

Q. How long at a time have you staid?

A. Half an hour, or only five minutes sometimes.

Q. Muller was there the whole day?

A. Yes, it was his business to attend to it.

Q. He lighted the fire and managed the oil vessel?

A. Yes.

Q. We understand this is the steam bin; you call it so, do not you? A. Yes.

Q. And that is the steam vent which opens into the steam bin to carry off the steam? A. Yes.

Q. And that lead pipe goes to the vessel containing the oil, to let the air into the oil? A. No, to let the air out.

*Mr. Serjeant Vaughan.*—That is very good, to let the air in.

*Mr. Scarlett.*—You will find it so indeed, otherwise your pump could not work: he is not a man of science, or he would have known that.

*Mr. Serjeant Vaughan.*—You would not have put the question if you had supposed him a man of science.

*Mr. Scarlett.*—How high was the steam vent?

A. To the top of the chimney.

Q. What was the height? A. Seventy feet, I suppose.

Q. From the top of the building?

A. Begging your pardon, from the bottom of the whole to the top, would be seventy feet.

Q. What would be the height of this floor?

A. Eight feet.

Q. So that it would be sixty-two feet? A. Yes.

Q. Above that the end of the pipe went about sixteen feet?

A. Yes, about sixteen feet from the vessel.

Q. It did not go very far into the steam vent?

A. About ten feet.

Q. This steam bin is over the sugar pan? A. Yes.

Q. When this was a sugar pan it served for both?

A. No, there is one on this side.

Q. Are they separate? A. Yes, they are separate.

Q. When were you last in the warehouse before the fire?

A. I was there the evening before the fire commenced.

Q. In this warehouse?

A. I passed through the warehouse to go into the fill-house that evening.

Q. Did you take notice of what was passing in the warehouse? A. They had done their work.

Q. Did you take notice of any circumstances in the warehouse at the time? A. No, I saw the fire was out.

Q. At the time you passed through the warehouse there was nobody in the warehouse?

A. I did not see any body there.

Q. But you saw the fire was out? A. Yes.

Q. You were there about seven o'clock in the evening?

A. Yes.

Q. Then you came down into this house? A. Yes.

Q. Was there any fire there?

A. That is the place I allude to; there is no fire kept any where else.

Q. There is no fire in the warehouse?

A. No, there is not.

Q. When do they begin working in the warehouse?

A. I cannot say exactly what time they begin working:— about the time they have done pulling up the goods they have boiled the day before.

Q. Is that done early in the day? A. Yes.

Q. Do they begin by candle-light? A. Yes.

Q. You have been telling this gentleman what they generally do, and I ask whether you know, when they generally begin working in the warehouse? A. I cannot say.

Q. You say, that about four days before the fire, you had taken out this oil vessel to repair it? A. Yes.

Q. Because you understood it had been subject to a little leakage? A. Yes.

Q. What did you do with the oil?

A. It was taken out and thrown away, I believe.

Q. Do you mean to swear the same oil was not put in again?

A. No, I cannot say.

Q. Who has told you it was not the same oil?

A. Nobody.

Q. Did you observe it leaked a little afterwards?

A. It dropped a little now and then, but not much; scarcely any but a drop now and then came down.

Q. During the half hour you staid to look at it?

A. I did not stay half an hour always, but only a few minutes.

Q. It had been put into repair four days? A. Yes.

Q. How long have you been, on any one of those days, to see whether it leaked? A. I cannot say.

Q. Will you swear you were there half an hour to look at it? A. No.

Q. Will you swear you were there ten minutes? A. No.

Q. Will you swear you were there five minutes observing it? A. No.

Q. Will you swear you saw it leak within four days?

A. Yes.

Q. Do you believe you were there for ten minutes at any one time? A. I cannot say, indeed.



Q. Were you there more than once a day?

A. Yes, two or three times a day.

Q. Did you observe the leaking each time?

A. There was a drop came down now and then, when the door was open, but I did not see into the fire-place unless the door was open as I passed it.

Q. Do you know how many times the door was open as you passed it?

A. As soon as they found the heat too great they opened it, and then, perhaps, I saw a drop or two.

Q. Then, when the door was open, you did see a drop or two?

A. I cannot say that.

Q. I want to know what opportunity you had of seeing that, that enables you to say it leaked less than it had done before?

A. I am sure it leaked less; for before that they could not keep the fire in.

Q. It had put the fire out before?

A. Yes, they could not keep the fire in for the leaking, before it was repaired.

Q. How long had it been in that state?

A. Not long: I do not know whether it was half a day that they worked so.

Q. You do not know whether it was half a day, or half a week?

A. It was not more than half a day, I dare say.

Q. It was the workman who was employed who knows that?

A. Yes.

Q. That is Muller?

A. Yes.

Q. He must know, then, how much it leaked before, and how much it leaked after.

A. I suppose so.

*Re-examined by Mr. SERJEANT LENS.*

Q. What carried you through the warehouse when you were going away? Was that your way out?

A. That was the way down to the fill-house.

Q. Was that your way out?

A. Yes.

Q. You had no particular business to do there?

A. No.

Q. At that time the warehouse was in the state you have described?

A. Yes.

Q. You have been asked about this lead pipe which goes into the steam vent about sixteen feet; whatever goes up through the lead pipe, goes into the steam vent?

A. Yes.

Q. It then goes up higher, and so into the air?

A. Yes.

Q. Then the lead pipe does not run all the way up to the steam vent?

A. No.

Q. From the steam vent it is carried out in the way you describe, by these lateral passages?

A. Yes.

*A Juryman (Mr. Mavor).*—You have stated that you observed the fire was considerably affected by the dropping of the oil, was that the cause of the repair before the four days you have spoken of?

A. Yes, the cause of the repair of the oil vessel.

Q. The dropping of the oil upon the fire, and the extinguishing of the fire by that means?

A. Yes, it was unpleasant to work it so.

*Another Juryman.*—Did you ever know the fire put out by the dropping? A. Yes, it was nearly put out by the oil.

*Mr. Serjeant Lens.*—If you turn a candle down it will put it out.

*Lord Chief Justice Dallas.*—It will depend upon the quantity and so on. You have known these premises for three years? A. Yes.

Q. Did you ever know any fire during that time? A. No.

Q. Within three months from the introduction of this, from whatever cause it was, this fire took place? A. Yes.

HENRY MAY Sworn.

*Examined by Mr. SERJEANT VAUGHAN.*

Q. I believe you were engine keeper to the plaintiffs, Messrs. Severns, at the time this fire happened? A. Yes.

Q. How long have you been in that situation?

A. I have been off and on for many years.

Q. How many years?

A. I suppose four and twenty years, or more than that.

Q. Did you happen to be on the premises on the evening of the 9th of November, before the fire happened?

A. Yes.

Q. At what time in the evening were you there, and how long did you continue there? A. Till nine o'clock.

Q. Do you remember seeing the last witness, Duke, there?

A. He was there with me in the engine-house; he went away before I did.

Q. What were you doing in the engine-house?

A. Packing what we call the piston belonging to the engine.

Q. What do you mean by packing it?

A. Putting hemp in, and then screwing it down.

Q. How long did you continue there that evening after Duke had left you, which he says was about eight o'clock?

A. About nine o'clock I went away.

Q. Were any other persons left on the premises except the watchman, when you went away?

A. Not that I know of; I left only the watchman that I know of.

Q. When you left the premises, did every thing appear to be safe and right?

A. Yes, all appeared to be safe and right at that time.

Q. At what time in the morning did you return to the premises?

A. About three, or it might be ten minutes afterwards.

Q. Were you one of the first that went there?

A. I cannot say whether I was the first, I think there was somebody in the fill-room.

Q. Where did you go to? A. To the engine-house.

Q. What was your business at the engine-house at that time in the morning?

A. To prepare and get the engine ready for working.

Q. Was the fire to be lighted for that purpose? A. Yes.

Q. Did you light the fire?

A. The watchman lights the fire generally.

Q. Was it lighted before you came? A. Yes.

Q. Did you make it up, or attend to it?

A. I made it up and attended to it.

Q. Did any thing appear wrong at that time?

A. No; I saw nothing wrong at that time.

Q. How soon after you were there, which you have told us was a few minutes after three, did you go to the grinding-house?

A. It might be 20 minutes; I went through the grinding-house.

Q. To what other room or place did you go?

A. I opened a door and went into the long-house, on the warehouse floor.

Q. Do you remember being on the top of the steps that lead from the warehouse to the fill-house?

A. Yes; I called down from the steps of the warehouse leading into the fill-house, to know whether they were ready.

Q. With a view to your putting the engine to work, I suppose? A. Yes.

Q. What answer did you receive?

A. I received an answer—No.

Q. Meaning that they were not ready? A. Yes.

Q. Did you return to the same spot and call again?

A. Yes.

Q. At what distance of time?

A. I suppose about ten minutes.

Q. What did you say to them then?

A. They told me they should be ready in a few minutes, as soon as I called.

Q. Upon your being told they would be ready in a few minutes, what did you do?

A. I went back and stirred my fire up, for the purpose of starting the engine.

Q. Whereabout is the fire of your engine?

A. It is up in the yard, as soon as you enter the building.

Q. It is not within any part of the premises we are now speaking of?

A. No, it is not; it is quite in a place by itself.

Q. You went to prepare to start your engine, to set it to work?

A. Yes.

Q. How long had you been with your engine before you heard any alarm?

A. When I came down —

Q. Did you start your engine?

A. Yes.

Q. How long had it worked before you heard any thing, or saw any thing?

A. I cannot speak to a minute; I got off the stage, and went out into the yard, and out at the door.

Q. What then happened to you?

A. That is all I know; but in a few minutes afterwards I heard an alarm of fire.

Q. In consequence of hearing that alarm of fire, where did you go to?

A. I ran through the mill-room.

Q. Where did you go to from the mill-room?

A. When I went through the mill-room, there is a door opens to the left, on to the warehouse floor, where this fire was, out of the mill-room,

Q. Describe, as accurately as you can, to these gentlemen, what appearance you observed on the warehouse floor?

A. When I went to the door, I saw a fire upon the left.

Q. Point to the spot; describe the way you came in to the warehouse floor;—did you go up the steps?

A. I had only one step to go from the mill-room.

Q. Shew us the way in which you went?

A. I left this [*pointing to the pump*] more upon my right, when I got out of the mill-room, and I saw the fire upon the left.

Q. Describe what appearances you saw upon the floor?

A. I could not tell, further than that I saw a great smudge, and smoke, and fire.

Q. Did you observe whether there was any hole in the floor, as if the fire came from below,—or how was that?

A. I saw no hole,—there was nothing of the kind that I saw.

*Mr. Solicitor General.*—You go up only one step; the mill floor and the grinding-house floor are on a level?

*Mr. Serjeant Vaughan.*—Do you go up one step from the mill-room floor to the warehouse floor?

A. Yes, only one step brings us on that floor.

Q. And then you saw, to the left of you, fire upon the floor?

A. Yes.

Q. Do you call the mill-room and the grinding-house the same?

A. Yes, they are the same thing.

Q. Describe to these gentlemen, as accurately as you can, what it was you saw;—you saw fire and smoke to the left?

A. Yes.

Q. What more did you observe?

A. I saw nothing more.

Q. What was there upon that floor?

A. Nothing more than usual from the packing.

Q. What was there there?—were there any hogsheads?

A. There were empty sugar hogsheads, and full sugar hogsheads, and straw and paper for packing.

Q. It is used as a packing warehouse? A. Yes, it is.

Q. Upon your seeing these appearances of fire upon the floor, what did you then do?

A. I ran back, and ran away and called a fellow servant, to go up and fasten all the iron doors about the premises that we could.

Q. Did you examine whether the iron doors were shut or open?

A. They were shut, the chief of them,—those I went to I found close,—I pulled it to me, and went to the door,—I did not go in.

Q. Just mention the iron doors of what rooms?

A. I found them all fast,—I went round where I could.

Q. What was the first iron door you went to?

A. I went up stairs above the mill-room, that is, what is called the warehouse floor.

Q. The iron doors on that floor, were they closed?

A. Yes, they were, and every thing perfectly right.

Q. How near is the iron door you were speaking of to the steps?

A. The door where I went up to look above, to see that the doors were fastened; I went up stairs to them, not through that building, but the other.

Q. Did you go into what is called the new warehouse?

A. No.

Q. But the iron doors you examined were all shut, and closed? A. Yes.

- Q. What was the consequence of this fire?  
 A. I am sure I cannot tell.  
 Q. Were the premises burnt down?  
 A. There is one that is not burnt.  
 Q. How long were the premises burning, before they were down?  
 A. I suppose not above three hours.  
 Q. Were the grocery warehouse, and the long-house, and new house, all burnt.  
 A. Yes, they were all burnt.

*Cross-examined by Mr. SCARLETT.*

- Q. I must trouble you with some questions. You are the watchman—no,—engine keeper?  
 A. I am the engine keeper.  
 Q. You left the premises about 9 o'clock the night before?  
 A. Yes.  
 Q. At that time, was there any fire upon any part of them?  
 A. No.  
 Q. The engine fire, if I understand you, is in the yard?  
 A. Yes.  
 Q. I believe, if you understand the plan, this is the long sugar-house?  
 A. Yes.  
 Q. This is the grinding-house?  
 A. Very good.  
 Q. This is the new sugar-house?  
 A. Yes.  
 Q. And this the warehouse?  
 A. Yes.  
 Q. And over this is this warehouse?  
 A. Over the grinding-house.  
 Q. Just tell me whereabouts the fire for the engine is?  
 A. When you go out to the street, you go up the yard, and the second door-way up the yard, directly as you turn upon the left.  
 Q. That is here?  
 A. Yes, the second door-way.  
*Mr. Solicitor General.*—There is no dispute about that:  
 [*Mr. Scarlett puts his pen upon it*].  
*Mr. Scarlett.*—That is in an open yard, is it not?  
 A. About five or ten feet from the yard.  
 Q. What purpose does that steam-engine serve?  
 A. That steam-engine is applied to the mill-room, to turn the mills.  
 Q. In all the different places?  
 A. All in the mill-room.  
 Q. What do you call the mill-room?  
 A. Where they grind the sugars.  
 Q. This engine is used to turn the mills in the grinding-house?  
 A. Yes.  
 Q. Was it also used for the pump, to pump the oil?  
 A. Yes.

Q. Is it used for any other purpose?

A. Yes, to pull up the baskets of sugar in the different warehouses.

Q. It is used for all the different purposes of the premises?

A. Yes.

Q. The pump is not worked by hand, but by the steam-engine? A. Yes.

Q. What hour in the morning did you come to see your engine fire? A. About ten minutes after three.

Q. It had been lighted for you, had it?

A. Yes, the watchman, in general, lights it.

Q. Is the engine fire the first fire that is ever lighted upon the premises? A. Yes, it is.

Q. You say that when you had stirred the engine fire, you came to call to the man in the grinding-house, to know whether he was ready? A. Yes.

Q. Ready for what? A. To go on with this here.

Q. With the pump? A. Yes.

Q. Tell us, as nearly as you can, about how long might you have stirred your fire, before you went to ask him that question?

A. I went, I suppose, in the course of five minutes after I first came in.

Q. That might be a quarter past three? A. Yes.

Q. Of whom did you ask that, Muller?

A. Muller had the minding of this fire, I believe.

Q. Where about did you stand when you asked him that question?

A. Upon the top of the warehouse steps, I went across the grinding-house, and then here, [*describing it on the model*].

Q. When you had to ask the man in the grinding-house, why should you go across there?

A. I go across that to the long-house door, the iron door that opens into the long-house; then I stop on the warehouse floor of the long-house, and holla down there, to know if they are ready.

Q. Then you went past him? A. No, not past him.

Q. This is the grinding-house? A. Yes.

Q. The man is in the grinding-house?

A. No, in the fill-house.

Mr. Scarlett.—I understood it to be said this is the warehouse, over the grinding-house?

Mr. Solicitor General.—No, the long-house is at the extremity of the grinding-house, that consists of several stories; the ground floor is the fill-house, and with respect to the other, we have nothing to do with it.

*Mr. Scarlett.*—I beg your pardon, I was confounding this with the next cause in fact, as my learned friend had done: I want to know which warehouse it was that you went into? you crossed the grinding-house, and stood on the stairs?

A. Yes, by an iron door that goes into the long-house.

Q. Muller was in the house? A. Yes.

Q. In the fill part of it? A. Yes.

Q. You asked him that question?

A. Yes, I holla'd from the top of the steps, to know whether he was ready, as usual.

Q. You did not take any light with you, of course?

A. No, I did not.

*Mr. Scarlett.*—Perhaps your Lordship will find this important: you had no light with you at the time? A. No.

Q. Was there any light in the warehouse?

A. Yes, a lamp hanging in the mill-room; but we do not generally carry any light; Master never allowed that.

Q. Do not tell us what your Masters allowed; there was a lamp in the grinding-house through which you passed?

A. Yes.

Q. But no lamp in the warehouse? A. No.

Q. Nor any fire in the warehouse? A. No.

Q. And you brought no light with you? A. No.

Q. Then the state of the premises, at the time you spoke to Muller, to ask whether he was ready for the engine, was this, that you had a fire under the engine, that Muller had lighted his fire in the fill-house, and there was the usual lamp in the grinding-house?

A. There was a lamp hanging up always from the time we came in; the watchman lights it before we come in, and we carry no candle.

Q. There was no light at all, except the light from that lamp, and such light as Muller's fire had made, where he was?

A. Yes.

Q. This was about a quarter past three in the morning?

A. Yes.

Q. Muller told you he was not quite ready? A. Yes.

Q. Then you went back to your engine? A. Yes.

Q. Did you return again to Muller before you heard the alarm of fire? A. Yes.

Q. How long did you stay at your engine?

A. It might be half an hour, it might be twenty minutes.

Q. We will take it which ever you please. You then came back, and asked Muller again, whether he was ready?

A. Yes.

Q. When you came back, you came to the same place?



- A. Yes, I came to the same place again.
- Q. Did you see any light then in the warehouse?
- A. None at all.
- Q. There was a lamp in the grinding-house, as before?
- A. Yes.
- Q. And Muller had been getting up his fire? A. Yes.
- Q. What did Muller tell you; that he was ready?
- A. That he should be ready in the course of a few minutes.
- Q. Then you went back to get your fire ready, and put on your engine? A. Yes.
- Q. So that the pump had not began to work when you got back? A. No.
- Q. Had you put on the engine before you heard the alarm of fire? A. Yes.
- Q. How many minutes?
- A. I cannot speak exactly, but ten minutes or a quarter of an hour.
- Q. How long had you quitted Muller before you heard the alarm of fire?
- A. I suppose ten minutes, or a quarter of an hour.
- Q. You heard the alarm of fire, and then you ran back to the same place?
- A. Yes, to the same place where I had been, when I asked him.
- Q. Now, I desire to know whether you saw Muller?
- A. I did not see him; I never went down at all that morning.
- Q. Did you call to him? A. Not then.
- Q. When you went back, after the alarm of fire, whether Muller was in the fill-house or not, you cannot say?
- A. No, I cannot.
- Q. How long might you have staid at the warehouse door, where you say you saw this fire: did you pass through this warehouse?
- A. I passed across, through the mill-room; I only just opened the door upon the jar, when I saw the fire, just to look in.
- Q. When you looked in, do you know what they called the steam bin?
- A. That is it, [*putting his hand upon it*].
- Q. How is that situated to you?
- A. We go in almost opposite the steam bin.
- Q. The door being ajar, and you being opposite the steam bin, you saw what appeared to you to be a fire upon the floor?
- A. Yes, on my left.
- Q. According to the representation, you would be about here?

*Mr. Solicitor General.*—That is not the plan of that floor.

*Mr. Scarlett.*—Are the iron doors of the different floors one over another?      A. Yes, they are.

Q. What you saw was to the left?

A. Yes, I opened the door in this way: the door pulled to me.

Q. To the right or left?      A. To the left.

Q. Then the door must have half hid the fire?

A. The fire was to the left.

Q. Behind the door?

A. No, not behind the door; I looked through, on pulling the door to me.

Q. Did you open the door with your left, or your right hand?      A. I opened it to the left.

Q. Then the fire was to the same direction as you opened the door?      A. Yes.

Q. How long might you remain there?

A. Not a minute; as quick as I could, I shut the door.

Q. And away you went?      A. Yes.

Q. Did it seem a considerable fire?

A. It seemed, in my opinion, to be very dangerous: I went as quick as possible.

Q. Did it appear a considerable fire?

A. There did not appear a great body of fire at that time.

Q. Did you go into the fill-house below?      A. No.

Q. You never went there at all?      A. No.

Q. Now just describe the iron doors, as you are an engineer. There are iron doors that open on the different floors of the long-house into the grinding-house.      A. Yes.

Q. An iron door in each floor?      A. Yes.

Q. There are also iron doors on each floor that communicate from the new house, both with the long-house and with the grinding-house?      A. Yes.

Q. These iron doors were on each floor?

A. Yes, one above another.

*Re-examined by Mr. SERJEANT VAUGHAN.*

Q. Are these double doors:—are there two doors?

A. Yes.

Q. You saw the fire on your left?      A. Yes.

Q. The door opened to you?      A. Yes.

Q. You opened the left hand door to you?      A. Yes.

Q. And you then saw, to the left of you, the fire?

A. Yes, I did.

**CHRISTIAN LAMP Sworn,**  
*Examined by MR. SERJEANT TADDY.*

Q. Were you in the employ of Messrs. Severn, as warehouseman?      A. Yes.

Q. What was your duty, as warehouseman?

A. To pack the refined sugar.

Q. Was it also your duty to charge the pans?      A. Yes.

Q. In charging the pans, what was your course as to emptying the hogsheads of sugar?

A. We emptied them on the floor of the warehouse.

Q. In order to supply the material for charging the pans?

A. Yes.

Q. Do you recollect, whether on Monday, the 8th. of November, which preceded the fire, you had packed any hogsheads?

A. Yes, some large hogsheads with straw.

Q. How many?      A. Twenty.

Q. That is over the fill-house?      A. Yes.

Q. When was it that these hogsheads were removed?

A. On Tuesday, the day after.

Q. Do you recollect whether, after they had been packed and removed, there had been any straw left on the warehouse floor?

A. Yes, there was always some straw lying about.

Q. What was the course, with respect to straw that happened to be left?

A. It was used another day; we were in the habit of using some straw every day.

Q. So that it frequently happened, that straw left one day, was used another?      A. Yes.

Q. Do you remember, whether the day previous to the fire you had emptied any hogsheads on the warehouse floor?

A. Yes.

Q. About how many?      A. Six or seven hogsheads.

Q. Whence did you procure the sugar, with which you charged the pans for the day following?

A. Some of it was lying on the floor, and we charged a pan with some of it.

Q. Which was that pan?      A. The single pan.

Q. Which pan was that?      A. This pan in the corner.

Q. That pan you charged with part of the sugar that remained on the floor?      A. Yes.

Q. The other part of the sugar remained on the floor?

A. Yes.

Q. What time was it that you had charged that pan?

A. I cannot tell exactly what time.

Q. Was it the night before the fire? A. Yes, it was.

Q. Can you recollect whereabouts it was in the evening that you had charged it?

A. I cannot exactly tell, it might be after four o'clock, it might be near five.

Q. Somewhere between four and five o'clock, you charged the pan? A. Yes.

Q. Where were the candles that were used about the premises left of a night? A. On the warehouse floor.

Q. When the men went away?

A. They leave them in the warehouse, and in the morning they get them again.

Q. Where do they leave them?

A. There was not a particular place for them.

Q. Were there any empty hogsheads left on the warehouse floor? A. Yes.

Q. It was the usual habit that there should be some there, and it was so on that evening? A. Yes.

Q. Are those hogsheads always scraped clean?

A. They are usually scraped clean before they are turned out, but there is generally some sugar inside.

Q. What is the operation by which the interior sugar, which adheres to the sides, is taken off?

A. They are scraped, and then steamed afterwards.

Q. You say the men left their candles sometimes in one place, and sometimes in another, did they ever leave them on the hogsheads?

A. Sometimes they put them upon the hogsheads.

Q. What time was it you left the premises on the night before? A. About six o'clock.

Q. What time did you return the next morning?

A. I did not return at all.

*Cross-examined by Mr. SCARLETT.*

Q. I believe you know that there was a gas-light here, that Muller used? A. Yes, there was a gas-light.

**HENRY WINNING Sworn,**

*Examined by Mr. STEPHEN.*

Q. Were you a workman in the mill? A. Yes.

Q. Do you know what used to be done with the candles at night, when the workmen left?

A. I have frequently seen them come down to the warehouse door and blow them out; I have seen them, as I have been going in, come down and blow their candles out.

Q. Where did they go for them in the morning?

A. They generally found them there in the morning.

*Lord Chief Justice Dallas.*—Where did they put them when they blew them out?

A. Sometimes they did not work of an evening up stairs, but those below used to come, in an evening, to look at the coppers.

*Mr. Stephen.*—Where did they leave them?

A. Sometimes lay them down on a hogshead.

Q. Had such hogshead sugar about it? A. Yes.

Q. You recollect the day of this fire? A. Yes.

Q. What time in the morning did you come to the premises? A. About four o'clock.

Q. When did you hear the alarm of fire first?

A. I was at home a-bed.

Q. When you came to the premises, did you know the fire was raging? A. Yes.

Q. Where did you come first?

A. In at the gate, and through the grinding-house, and into the coal-cellar.

Q. When you were in the grinding-house, had you an opportunity of seeing the warehouse door?

A. The door was shut.

Q. Did you observe any thing particular there?

A. Nothing more than a cracking and burning.

Q. Then you heard a cracking and burning? A. Yes.

Q. Where did that cracking and burning seem to proceed from?

A. It seemed to proceed from the warehouse floor of the long-house.

Q. Did you at that time try the heat of that door with your hand? A. Not the first time.

Q. Under the grinding-house there is a coal-cellar?

A. Yes.

Q. Does that communicate with the fill-house of the long-house? A. Yes, by an iron door.

Q. Did you go to that door of communication between the fill-house and the cellar? A. Yes.

Q. Was that door shut or open? A. Shut.

Q. Did you there hear any cracking? A. No.

Q. Did you try the heat of that door?

A. Not to lay hold of it, but I was as close to it as could be,—but I perceived no heat.

Q. Did you perceive any appearances of fire about that door, or about the fill-house? A. No.

Q. Did you then go up again to the grinding-house?

A. Yes.

Q. Did you make any new observation about the door of the warehouse?

A. Yes; after I went up again I perceived that the door was not bolted.

Q. Though it was not bolted, was it closed?

A. It was closed.

Q. You could not therefore see into the warehouse?

A. No.

Q. Did you take any step with regard to that door?

A. Yes,—the door was so very hot, I could not lay hold of it' any how.

Q. What did you do with it?

A. There was a pick-axe lay near the place, and there were two handles to the door, and I tried to force it so that I could bolt it; I got the pick-axe to bolt it with.

Q. Did you use the pick-axe in consequence of the heat of the door? A. Yes.

Q. Did you see the colour of the door,—was it its usual colour? A. It was then.

Q. Did you go into the new-house warehouse upon this?

A. Some time afterwards.

Q. How long afterwards?

A. About twenty minutes afterwards.

Q. You were then upon a level with the warehouse of the long-house? A. Yes.

Q. There is a door of communication between that and the new-house warehouse, and the grinding-house. A. Yes.

Q. We have heard there was a communication below, between the new-house fill-house and the fill-house of the long-house? A. Yes.

Q. There was a fill-house under the new-warehouse, was not there? A. Yes.

Q. And that was on the same level with the long-house?

A. Yes.

Q. There was a communication between the warehouse of the new-house and the fill-house of the new-house, was not there? A. Yes.

Q. And there was also a communication between the fill-house of the new-house and the fill-house of the long-house?

A. Yes.

Q. When you first went into the new-house warehouse, what appearance presented itself to you?

A. The warehouse floor was full of smoke.

Q. The floor of the warehouse was full of smoke?

A. Yes.

Q. In what part of the room did you observe the smoke?

A I found it as soon as I got in a few steps,—I found the smoke so strong, I could not proceed.

Q. That was in the warehouse of the new-house? A. Yes.

Q. That is on a level with the warehouse of the long-house. A. Yes.

Q. Was the smoke in any particular part of the room.

A. As far as I could judge, it was all over the room?

Q. Had you the means of judging where that smoke came from?

A. I judged it came from the long-house warehouse, knowing that was on fire.

Q. Was there any appearance there at the time, which led you to believe it came from the long-house warehouse?

A. When I first got in, I could not perceive where it came from; I was obliged to go back twice; the third time, I found the smoke very bad, but I went in on my hands and knees.

Q. Why did you do that? A. To avoid the smoke.

Q. The smoke would be above you? A. Yes.

Q. Did you, so crawling on your hands and knees, get to the door of communication between the warehouse of the new-house and the warehouse of the long-house? A. Yes.

Q. What did you see there?

A. I saw a light and some smoke.

Q. You say you there perceived a light and a smoke?

A. Yes.

Q. Did that light and smoke appear to issue from the door of communication? A. Yes, from the long-house warehouse.

Q. Did that appear to be the cause of the smoke in the warehouse of the new-house?

A. Yes, it appeared to me so.

Q. After this, did you go down to the fill-house of the new-house?

A. I, after that, returned into the mill-room, to see that the doors were safe, and that the men were attending to them.

Q. Did any thing material happen there?

A. No,—only the door being so hot.

Q. Did you go down to the fill-house of the new-house?

A. Yes.

Q. That is the floor under the warehouse floor of the new-house? A. Yes.

Q. What was the state of the fill-house of the new-house in respect of smoke?

A. When I looked down the pulley-hole, the way we had to go down, I perceived there was no smoke there.

Q. That fill-house was upon a level with the long fill-house? A. Yes.

Q. What was the state of the door of communication between the two fill-houses?

A. It was open,—it might be open a foot.

Mr. Scarlett.—What fill-houses do you mean?

Mr. Stephen.—The fill-house of the new-house, and the fill-house of the long-house. Did you look into the fill-house of the long-house in which was this oil apparatus A. Yes.

Q. Was the room light or dark? A. It was light.

Q. Was that the light of the gas?

A. The light of the gas-light, and the light above from the windows to the street.

Q. Under these circumstances, could you see distinctly the state of the room? A. Yes.

Q. Did you there see any appearance of fire in the long fill-house?

A. There was just the appearance; on each side of the fill-house floor the fire was breaking through.

Q. You mean the fire in the floor of the warehouse was on each side breaking through? A. Yes.

Q. Excepting that, did you see any fire in the body of the fill-house? A. No.

Foreman of the Jury.—The breaking through was from the warehouse above? A. Yes.

Mr. Stephen.—There is no ceiling? A. No.

Q. Merely rafters?

A. The joists and the boards, that is all.

Q. Could you see particularly about the oil apparatus?

A. Yes, I could see that very well.

Q. Was there any mischief visible about that?

A. I did not perceive any.

Q. If there had been, were you so situated that you must have perceived it? A. I must have perceived it.

Q. When you went away, did you fasten the door?

A. Yes, and made it fast in the best way I could; the bolt was in the long-house.

Q. Did you observe the steam bin over the oil apparatus?

A. I could see every thing about the oil apparatus.

Q. Did you observe the steam bin? A. Yes.

Q. Did you see any fire about that? A. No.

Q. Then you returned? A. I then returned.

Q. And went about your business in the other part of the house? A. Yes.

Q. From all the appearances that met your observation, what was your opinion as to how the fire began?

Mr. Scarlett.—I object to that question.



*Cross-examined by Mr. SERJEANT BLOSSET.*

- Q. What is your particular business?  
 A. I work in the mill-room.  
 Q. Are you one of the engine men? A. No.  
 Q. What is it you work at?  
 A. Packing the sugars, and weighing, and such as that.  
 Q. How far do you live from the premises?  
 A. To say the distance, in feet, I cannot; I live close by.  
 Q. You are a family man? A. No.  
 Q. Have you lodgings there? A. Yes.  
 Q. How far are your lodgings from the premises—from the long-house corner; is it this way? A. Towards Whitechapel.  
 Q. How far is it?  
 A. It is the second door from Hollaway-street, on the opposite side of the way.  
 Q. You were in bed when you heard the alarm? A. Yes.  
 Q. Which was a very loud and violent alarm? A. Yes.  
 Q. It was loud enough to wake you? A. Yes.  
 Q. They were knocking at the doors? A. Yes.  
 Q. And a general alarm of fire? A. Yes.  
 Q. Can you tell us about the time when that alarm took place?  
 A. It might be about four o'clock, but I cannot say precisely the time.  
 Q. It might be a little after? A. Yes.  
 Q. And upon that you got up and dressed yourself, and saw all that you describe? A. Yes.

*Mr. GEORGE WICKÉ Sworn.**Examined by Mr. SERJEANT LENS.*

- Q. You are a sugar refiner, I believe? A. Yes.  
 Q. Do you live near these premises of Messrs. Severn?  
 A. I live very near.  
 Q. Do you recollect, on the morning of the fire, being alarmed with the cry of fire? A. Yes, very well.  
 Q. Did you get up? A. Yes.  
 Q. Did you go on the premises of Messrs. Severn?  
 A. In the street, near it.  
 Q. What time was it?  
 A. From eighteen to twenty minutes past four, to the best of my recollection.  
 Q. From the spot where you were, could you look into the premises? A. No.  
 Q. Did you go where you could see into the premises?  
 A. No.

Q. What did you observe?

A. I was alarmed by the watchman's rattle, and I heard a loud knocking in Union-street.

Q. Did you look into the long-house, or the fill-house?

A. Yes, I went within a yard and a half.

Q. To what part of the premises did you go?

A. I looked into the fill-house of the long-house.

Q. At what end? A. In Union-street.

Q. Looking in from Union-street, you could look all through the premises? A. A good way.

Q. Could you see quite down the fill-house?

A. I could see distinctly as far as the middle of it.

Q. What did you observe there, any fire or smoke?

A. I saw no fire.

Q. If there had been fire between you and the middle of the fill-house, you must have seen it? A. I think so.

Q. Was there any smoke there?

A. I could not perceive any.

Q. Could you see distinctly through down half way?

A. I could only see through the windows, there were none broken.

Q. Did you observe the floors, either there or at any other part; could you see whether there was any thing on the floor?

A. No.

Q. You saw neither fire nor smoke, but saw distinctly to about the middle of that room? A. Yes.

Mr. SAMUEL AUBER Sworn.

*Examined by Mr. SERJEANT TADDY.*

Q. Do you live in the neighbourhood of Messrs. Severn and Company? A. I do.

Q. Were you awakened on the morning of the fire, by the springing of rattles? A. I was.

Q. About what time did you go to the premises?

A. As near as I can recollect, about four o'clock; I am not positive whether the clock had gone four.

Q. On which side did you approach them?

A. That corner next Hollaway-street, in Union-street.

Q. How high is the window of the warehouse of the long-house from the ground?

A. I should think the bottom part of it might be somewhere about this [*describing it*].

Q. About your breast?

A. Yes, or a little lower.

Q. So as to enable you to look clearly into the long-house?

A. Yes.

**Q.** Into the warehouse of the long-house?

**A.** Yes, what I call the ground floor.

**Q.** You say you call it the ground floor, is the lower floor of all something below the ground?

**A.** Yes, it is considerably below; I should think the fill-house floor (the cellar as it might be called) is six feet below that.

**Q.** Were you enabled to look in at the window of the warehouse floor as I call it? **A.** I was.

**Q.** What were the appearances that you saw, when you looked in?

**A.** I looked in at the second window from the corner of Union-street, and saw a small body of fire, and a large quantity of black smoke.

**Q.** From what part of the room did it appear to you to proceed? **A.** From the very spot to which I stood opposite.

**Q.** The window that you looked in at, looked across, as I may say, and commanded the whole of the warehouse. You came up Union-street? **A.** Yes.

**Mr. Solicitor General.**—Was it at an end window, or a side window?

**A.** The next window to your thumb [*describing it*].

**Q.** The second window from the corner? **A.** Yes.

**Mr. Serjeant Taddy.**—When you looked in, where was the fire, was it opposite, or at the right or left?

**A.** The fire was a little inclining to the left, but nearly opposite to me.

**Q.** Could you tell whether there was any fire in the lower floor of the fill-house?

**A.** There was a small quantity of fire, when I first approached there, but it appeared to descend, not to ascend; because I stooped down, and looked into the upper part of the lower window.

**Q.** Are you subpoenaed on the other side?

**Lord Chief Justice Dallas.**—That is not material.

**Mr. Solicitor General.**—He is a witness on both sides?

**Mr. Scarlett.**—I do not exactly agree to that.

**Mr. DANIEL WILSON Sworn.**

*Examined by Mr. SOLICITOR GENERAL.*

**Q.** Are you acquainted with the manufactory, and refining of sugar? **A.** I am.

**Q.** Have you been much conversant with it?

**A.** For about six years I have devoted my whole time to it.

**Q.** Are you acquainted with the application of oil for that purpose? **A.** I am the patentee of that process.

Q. Do you know of any application of oil or tallow for that purpose, at Liverpool?

A. Yes, I do, I have fitted up two houses there, the houses of Messrs. Freeland, Harris, and Co., and of Mr. Richard Unsworth.

Q. How long is that ago? A. That was in the year 1817.

Q. Do you know of any other persons that have used oil for that purpose?

A. There was a small apparatus erected in the house of Messrs. Craven and Bowman, and another in the house of Messrs. Severn, King, and Company, those are all I know of.

Q. The present plaintiffs? A. Yes.

Q. Did you assist in fitting up the apparatus in question?

A. It was done, I may say, almost entirely under my direction.

Q. We are told, that, previously to the application of that oil vessel, there was a pan there?

A. Previous to the alteration made here, there were three pans, one in the corner, and another in the place of the oil vessel; they were all heated by fires under them, in the ordinary way.

Q. Is there any danger arising from the application of fire, in the ordinary way? A. Very considerable.

Q. What does that arise from?

A. There are several causes that give rise to it, one of them, the extreme danger of boiling over; another, I believe, is, that from the great combustibility of sugar, it is decomposed at a temperature of  $344^{\circ}$ , and will then give out inflammable gases.

Q. What is the boiling point of sugar?

A. About  $245^{\circ}$  in the highest kinds of proof.

Q. It gives out at  $344^{\circ}$  inflammable gases in considerable quantities?

A. Yes, and the boiling point varies a little from  $240^{\circ}$  to  $245^{\circ}$ .

Q. In your judgment, is the application of this process more or less dangerous than the ordinary mode?

A. I consider it much less dangerous.

Q. If any leakage takes place, what is the consequence of that?

A. That oil vessel did leak to a small extent.

Q. Did you observe it while it was so leaking?

A. I was there almost every day;—I may say every day.

Q. Did you go to observe it?

A. For the express purpose, it being a new thing there.

Q. You were employed to put it up, I believe? A. Yes.

Q. What was the consequence of the leakage?

A. The leakage, if it took place to a small extent, would burn off in the fire-place situated under it; if it leaked to a great extent, it would put out the fire altogether.

Q. Is there any proportion of leakage which could be attended with danger?

A. In my opinion, the whole quantity of oil in the vessel was quite incapable of doing any harm, situated as it was.

Q. Could the leaking of the oil into the fire, communicate fire to the oil in the vessel?

A. Quite impossible! no substance can burn without air, and this was a perfectly close vessel, except that small tube.

Q. Suppose the vessel were entire, except a leak, and the oil to run through into the fire, could it by possibility communicate fire to the oil in the vessel?

A. It is quite impossible.

Q. If the oil falls into the fire, what becomes of it?

A. It is there burnt, and converted into incombustible gases.

Q. And goes up the chimney?

A. And goes up the chimney.

Q. Is there any communication between the fire and the room, that gas can come out of?

A. There is a fire-door here by which it is fed.

Q. Can gas come out of that?

A. No, for the current is very strong up the chimney, otherwise the fire would not burn.

Q. So that whatever was created in the fire-place by the oil falling in, would go up the chimney?

A. It all went up the chimney.

Q. What temperature must the oil be brought to in the vessel, for the purpose of this operation?

A. The working points were between  $340^{\circ}$  and  $360^{\circ}$ , never exceeding  $360^{\circ}$ .

Q. Was there a thermometer for the purpose of regulating it?

A. There was.

Q. Graduated up to what point?

A. Four hundred and forty degrees, or thereabouts.

Q. Then you never contemplated its going up beyond that?

A. The thermometer would have broken if it had risen higher than the point to which it was graduated.

Q. What is the boiling point of the oil?

A. The boiling point of the oil is above  $600^{\circ}$ .

Q. At what temperature does it send out gas?

A. It sends out no permanently elastic inflammable gases under the boiling point,  $600^{\circ}$  or thereabouts.

Q. Does it send out any gases at a lower temperature that would take fire?

A. None.

Q. In order to get that at the heat of 600°, what kind of fire must there be?

A. I should conceive that several hours of very hard firing would be required to raise it to a temperature of 600°.

Q. Would several hours of the firing of that furnace be sufficient?

A. From the time which it takes, from my experience, to raise it a certain number of degrees, I can form an accurate opinion of what it would take to raise it to another point, and therefore I think it could not be raised to 600° in less than three hours.

Q. Could any neglect produce it?

A. I should conceive a man going away, leaving the fire that was there, would be productive of no harm whatever.

Q. Suppose such a fire under that as would be necessary to create inflammable gas, and suppose a similar fire had been under the sugar in the ordinary process, what would have been the consequence?

A. From the much lower temperature at which sugar is decomposed, it would emit inflammable gas, and take fire in the pan, by which the house would be burnt down long before the oil could be brought to a heat necessary to produce gas.

Q. There is much less tendency in this process to produce inflammable gases than in the ordinary way? A. Yes.

Q. If inflammable gas be produced by sugar in the ordinary mode, what becomes of it?

A. It comes out into the fill-house.

Q. From the whole surface?

A. From the whole surface.

Q. If inflammable gas be produced in the oil vessel, what course will it take?

A. It being quite a close vessel, except the tube which went up the steam-vent, it would have gone up that steam-vent.

Q. For what purpose is that pipe introduced?

A. It serves three different purposes;—the first is, that before the pump begins to work in the morning, there is a quantity of air contained in it, and it is necessary to give a vent to that when the pump is set to work, in order to prevent any compression in the inside of the vessel;—the next is, that with a common suction pump it is necessary to have an opening to the atmosphere. Both those purposes would be served by a simple perforation, but in fresh oil there is a quantity of aqueous vapour, which, for the first three or four days of the application of heat, rises.

Q. I need hardly ask if that is inflammable?

A. No, it is not; but it has a very bad smell, and would hurt the sugars if it got into the house; and in order to get rid of it, it is sent up the steam-vent.

Q. If any gas is produced in the oil vessel, it can only escape by that pipe?

A. Yes; this is a section of the upper part of the chimney, and the places occupied for fires come out perpendicularly, and the others laterally.

Q. If there was any gas it would come out by the lateral vents in the steam-vent, the chimnies going higher up?

A. Yes.

Q. How much do they project?

A. They are nearly level with the top. There is always a very strong current sets up the steam-vent.

Q. Is it possible for that gas, supposing it comes into the steam-vent, to get down into the house?

A. No: I consider it wholly impossible:

Q. From the manner the fires are fed, and the construction of the premises, can there be any draught down this steam-vent?

A. For the purpose of preventing any cold air getting into the body of the house, there are tubes of communication which feed the fires with fresh air from without: these are the tubes [*pointing them out*].

Q. Would that have the effect of preventing any draught down the steam-vent? A. Decidedly.

Q. How is the chimney constructed? is there any heat; or is it constructed so as to prevent heat in the brick-work?

A. The outer part is brick; and within there are cast iron pipes, and the flame passes up the cast iron pipes.

Q. Do the cast iron pipes touch the brick-work?

A. There is a free space between them.

Q. That is done to keep the chimney cool?

A. It answers another purpose.

Q. Is that one of the effects of it? A. Yes.

Q. Supposing, in the first place, the fire so managed, that the oil would produce gas, and it was so contrived that the gas should come into the room, I ask, whether it would produce any danger of explosion, as mixed with the atmospheric air in the fill-room?

A. I should think, none at all: the quantity of gas to render the whole premises explosive, would be 68000 cubic feet.

Q. In order to render atmospheric air explosive with gas, it must be mixed in a certain proportion?

A. According to Professor Brande's, *Memoir on Gas Light*,

it requires about seven parts of common air, and one part of gas.

Q. Was any quantity of heat applied to that oil, likely to produce the gas?

A. The whole quantity the oil could produce was only 8500 cubic feet; and the quantity necessary to render the atmosphere explosive, was at least 68000 cubic feet.

Q. Then could it, in your judgment, have caused explosion?

A. Quite impossible.

Q. Supposing all the doors shut, would it, in the fill-house alone, in any time you can measure?

A. No: in the long-house alone it would require 21000 cubic feet.

Q. The fill-house alone?

A. I think it is quite impossible.

Q. The fill-house has communications with the other adjoining rooms?

A. They all open to one another.

Q. Whatever might be the danger in that respect, would the danger be at least as great in the ordinary apparatus of sugar?

A. I consider much greater.

Q. Are there various modes of boiling sugar, for the purpose of refining, besides those you have mentioned?

A. Yes, there are.

Q. Perhaps there are no two sugar houses managed in the same way, in that respect?

A. There are a great variety of different processes.

Q. You cannot tell how the business is conducted?

A. We invariably ask, what process they adopt; how they boil? that is a general question.

*Mr. Scarlett.*—What evidence is that?

*Mr. Solicitor General.*—The question is correct, though the answer may be incorrect.

*Lord Chief Justice Dallas.*—Are all the processes equally innocent, or is there a difference in the danger?

*Mr. Solicitor General.*—Is there a difference in the danger?

A. The old process is considered infinitely more dangerous than any other.

Q. According to your enquiries, and as a question of science, do you consider it more dangerous?

A. No doubt of it.

Q. If any gas is produced, is not the vent pipe in the oil vessel, sufficient to carry it all off?

A. Quite so: ten times the quantity.

Q. And that is its general tendency?

A. From its lightness, it will generally rise.

Q. We are told it leaked some time before the fire, did you see that—and that it was repaired?

A. I did.



Q. Was it completely repaired?

A. Completely so: it dropped a drop in five minutes, perhaps, but I considered that nothing.

Q. When was it repaired?

A. Between the 29th of October and the 3d of November.

Q. Did you afterwards attend to its process, to see whether it was effectually done?

A. I was there a considerable time the day before the fire, and at three o'clock in the afternoon of that day it did not leak, except, perhaps, a drop in five minutes.

Q. Would that produce danger of any description?

A. Not the slightest.

Q. With respect to the oil, did you take the oil out for the repair? A. It was taken out.

Q. Had it diminished in quantity?

A. I could observe no decrease, but what could be readily accounted for by this trifling leakage.

Q. Does oil change its quality by repeated heating, so as to produce gas at a lower temperature?

A. I have used it two years—and, except its being in a trifling degree thickened, it is not altered.

Q. Is its tendency to produce gas altered? A. No.

Q. Have you looked at it with that view?

A. I have made experiments expressly for that purpose.

Q. After the fire, were you present when the apparatus was cleared of the rubbish? A. Yes, I was.

Q. Was that carefully done, with a view of ascertaining its situation, to see whether it had occasioned the mischief?

A. It was carefully dug up, and there were many persons present.

Q. Who were they?

A. A number of surveyors of different fire-offices and some engineers—Mr. Bryan Donkin, Mr. Ralph Walker, and Mr. Robert Hendrie.

Q. Did you perceive the retort, if I may so call it, at all injured?

A. There was an immense mass of rubbish lying upon it.

Q. Was there any rent or fissure upon it?

A. When they cleared away the rubbish, the oil vessel was standing perfectly in its original position; the four-inch wall, which was on one side of it, was as perpendicular as the day it was built; the fire door on its hinges, and the bars in the grate.

Q. Was there any fissure or rent, as if any explosion had taken place in the retort itself?

A. Not the slightest: the upper part of it was compressed; there was one very small part, to which a little bit of melted

brass was attached, and that had made a small hole, about the size of this [*describing it*].

Q. Whence had that fallen?

A. From the machinery, in all probability, over it, but that fused metal had not made its way through any thing but the cover at top.

Q. Around the top, was there any appearance of explosion?

A. Not the slightest, the top was compressed from the matters falling on it, the curvature of the bottom remained the same.

Q. There are some screws in the aperture which you call the man-hole, were those perfect?

A. Quite: and we unscrewed three or four of them, and they were all perfect, the thread of the screw quite bright and sharp.

Q. Do you remember observing any pots that were above?

A. There was a large quantity of pots above it.

Q. The man-hole is part?

*Mr. Scarlett.*—Nothing will turn upon that, I do not mean to ascribe any defect to that construction at all.

*Mr. Solicitor General.*—You say there were a number of pots above it? A. Ten feet high, at least.

Q. Were they in any part fused?

A. They presented a great appearance of fusion, and that appearance slightly decreased, as they came down; so that, those immediately incumbent on the oil vessel had no signs of fusion.

Q. Then, I need hardly ask you, from that circumstance, whether, in your judgment, the intensity of the heat was near the oil vessel, or in the upper floor?

A. Decidedly on the upper floor, on the floors above this.

Q. Did you make any observation upon the pump on the upper floor? A. The pump was very much fused.

Q. What was the pump made of?

A. Of cast iron, in a great measure, the material part of it.

Q. The copper vessel—was that melted?

A. The bottom of the copper vessel was very considerably melted.

Q. Had there been any coals underneath it?

A. When we boiled sugar in this pan, by the oil, we found a strong draught set up the chimney, and in order to prevent that, we one day filled the fire-place full of small coal, so as to cut off the draught.

Q. There had been coals put under to cut off the draught?

A. Yes.

Q. Had those coals caught fire?

A. Yes.

*Mr. Scarlett.*—The fire got below?

*Mr. Solicitor General.*—Yes.

A. We removed a considerable quantity of these, and we found the coals had been charred, and large quantities of charcoal were taken out by several gentlemen present.

Q. Do you know whether any beams that supported the warehouse floor had fallen in there?

A. They all gave way at last—there was one very large cast iron beam which lay somewhere across; but I cannot say its position exactly.

Q. Are the pipes that convey the oil, iron or copper?

A. Thick copper brazed: I consider this part of the work is best made of copper, to keep the sugar clean.

Q. Is it possible for the pipes to burst, from the pumping of the oil?

A. No, it is quite impossible: the tubes which conducted it were larger than the diameter of the valves, and therefore there could be no pressure in them.

Q. What was the appearance of the inside of the retort?

A. When we took off the man-hole, there was a quantity of carbonaceous matter on the bottom; several gentlemen took away pieces of it.

Q. What did that indicate?

A. That could only result from the gradual distillation of the oil.

Q. If there had been any explosion, would that have been the case?

A. If there had been any admission of atmospheric air, it could not have remained, it would have burnt off.

Q. And there could not have been an explosion of gas without? A. Undoubtedly not.

Q. Then, as the result of the whole, and exercising your judgment upon it, after all the inquiry you have made, did the accident arise from the oil apparatus?

*Mr. Scarlett.*—I object to the question—the Jury will judge of that.

*Cross-examined by Mr. SCARLETT.*

Q. You took a patent for this invention of boiling sugar?

A. Three patents.

Q. When was the first patent you took out?

A. In May, 1816.

Q. The second patent?

A. The second patent in January, 1817.

Q. And the third? A. In February, 1818.

Q. What was your occupation before?

A. I had been engaged in chemical manufactures.

Q. If I understood you right, you have applied your patent to four houses, two in Liverpool, and two in London?

A. Yes, that relates to sugar refining.

Q. I confine myself entirely to that at present. Do both those at Liverpool consist of oil, or has one of them tallow?

A. I believe they both used oil and tallow.

Q. You did not superintend them?

A. Yes, I did; but I believe they continued to work after I left Liverpool.

Q. Did they use tallow, or oil?

A. They used part tallow and part oil.

Q. By your recommendation? A. Yes.

Q. Then the third, I think, was Craven and Bowmans?

A. Yes.

Q. Did they use it long? A. Yes, they did.

Q. They use it now?

A. They used it, at intervals, for about three months; it was a small apparatus.

Q. When did you put it up for them?

A. I should think, as well as I recollect, about six months before I put up one for Messrs. Severn, King, and Co.

Q. When was that?

A. It began to work on the 18th of August.

Q. About six months before, you put up Craven and Bowmans? A. Yes, as well as I recollect.

Q. What made them leave it off?

A. I do not know whether they have left it off—they may work it now, for any thing which I know: I have not been there lately.

Q. Was it applied to boiling sugar?

A. It was never in the body of the sugar-house, it was applied to ascertain the rate at which it would boil.

Q. Was it a mere experiment?

A. It was larger than Severn, King, and Co's.

Q. Was it not a mere experiment, and did they ever apply it to their manufacture?

A. No, they did not apply it generally to their manufacture.

Q. I understood your first statement as if they had applied it to their manufacture, now you say not generally; did they apply it all?

A. They boiled sugar in it for that space of time.

Q. Was it not by way of experiment? A. Certainly.

Q. It was in a detached house from their sugar-house?

A. Yes.

Q. And in no part of the premises where they carried on their trade? A. The part where it was put—

Q. Cannot you answer that question?

A. I cannot answer, because I never was through all their premises; they kept part of them secret.

Q. It was a detached part?

A. They have about six and thirty different pans, and it covers four or five acres of ground, three-fourths of which I never have been in.

Q. You say it was in a detached part, was it not detached from the place where they carry on their trade?

A. It was within what is called their premises, not in a sugar-house.

Q. How far was it from any sugar-house?

A. I suppose about five yards.

Q. With a good thick wall between?

A. I should think so.

Q. You know it? A. I do not know it.

Q. And a passage besides? A. Yes, across a passage.

Q. And a wall between—perhaps two walls?

A. There was a sugar-house opposite a very narrow passage. I believe they used that house to steam casks in, or something of that sort.

Q. Are there many sugar-houses in Liverpool?

A. Five or six, I should think.

Q. A great many in London and the neighbourhood?

A. A great many.

Q. You have been asked whether there are not various processes for boiling sugar, of your own knowledge, what other processes do you know besides this and the application of heat under the pan?

A. They are so numerous I cannot answer that.

Q. Speak of your own knowledge?

A. There is Mr. Henry Howard's patent for boiling sugar.

Q. In what way?

A. He has three or four different patents.

Q. You mean the late Mr. Howard? A. Yes.

Q. The brother of the late Duke of Norfolk? A. Yes.

Q. His patent was for the refining of sugar?

A. Boiling sugar by steam in vacuo; he applies a pump to create a vacuum, and boils it by steam. There is also Mr. Taylor's patent.

Q. Is that for steam also?

A. Yes, high pressure steam. There is likewise a Mr. Cavallon's.

Q. Is that for steam?

A. No: that is a modification of boiling in the ordinary way, with a moveable pan?

Q. That consists of an alteration of the grate and the pan?

A. Yes.

Q. What other processes are there besides your patent and the steam patent?

A. It would be hard for me to answer to every mode.

Q. You say there are many? A. I have stated several.

Q. What processes are there distinguishable from the ordinary process of applying fire to the pan, except yours and the steam?

A. Mr. Wyatt has a patent for boiling sugar.

Q. In what way?

A. I believe it is by some machine inside the pan. I have never seen it at work.

Q. Do you know an instance of its being used?

A. I do not know any sugar-house that has been fitted up with it.

Q. Your experience with this commodity which you have a patent for, satisfies you that oil does not boil under 640°, or thereabouts? A. Yes.

Q. And that it emits no permanent inflammable vapour till it arrives at 600°. That you are quite sure of? A. Yes.

Q. When the machine was repaired, a few days before the fire, was the same oil put back into it?

A. The same oil, with some fresh oil.

Q. How much fresh oil?

A. We considered it advisable——

Q. I ask a fact: what quantity of fresh oil was introduced?

A. It amounted to about fifteen gallons, as near as I can recollect?

Q. What was the contents of the whole mass?

A. About one hundred gallons, after the addition of fifteen?

Q. How long had that been boiling?

A. We never boiled it at all, but it had been ~~used~~ from August until then.

Q. The same oil, except the diminution by the waste?

A. No, (you forget to ask whether there was not a larger quantity in depth after the repair, to what there was before it), the reason of putting in the fifteen gallons additional, did not proceed entirely from the waste, but we considered it advisable to work with a greater quantity of oil.

Lord Chief Justice Dallas.—There had been some diminution? A. Yes, a trifling quantity.

Q. And you put these fifteen gallons in, for what?

A. To make it work higher.

Mr. Scarlett.—What sort of solder was your retort soldered with?

A. It is not customary to solder wrought iron vessels.

Q. How did it leak?

A. It was seamed below: wrought iron vessels of that size are never made without seams and rivets.

Q. Then there was no solder, but only rivets? A. No.

Q. You have not stated to us, when you examined this retort after the fire, what had become of parts of it: you say you found it in a perfect state, except a compression; what became of the thermometer inside?

A. The thermometer formed no part of it; it was burnt, I suppose.

Q. You saw no vestige of it?

A. No; the scale was made of ivory, not likely to stand fire.

Q. How deep was it?

A. It went about half way—the bulb was about three inches under the surface of the oil.

Q. You mean when it was in its regular state? A. Yes.

Q. When it was full? A. It was never full.

Q. I mean before you began to work, you considered the thermometer three inches below the surface? A. Yes.

Q. Do you know whether the mercury in the thermometer will be suspended in the tube, when the bulb is broken sometimes?

A. Yes, it always is: the common effect that takes place is, that a portion of the mercury rises to the top of the tube.

Q. When the bulb is broken? A. Yes.

Q. It is not of much consequence; but as I always think, what my learned friend asks is important, I beg to know whether you had not a good deal of rubbish to dig away in the filling-house?

A. They were digging many days.

Q. Before you came to the retort and the copper pan?

A. Yes.

Q. According to your description of the pots that fell on the retort, there were ten feet of them; those immediately incumbent on the pan, presented no signs of fusion at all?

A. No, they were broken pots.

Q. Earthen pots? A. Yes, from the upper floor.

Q. They covered the copper also?

A. They covered the whole of the fill-house, as far as I could see.

Q. If there was no fire that could come so near to the top of this retort, as to burn the pots that fell upon it, how did the fire get below the copper, and burn the copper?

A. Very naturally: for a week after the 10th of November, the fire was burning in the ruins, and there was a strong cur-

rent excited up all the chimnies, through the interstices in the rubbish.

Q. Which you think might have set the coals on fire, and burnt the bottom of the copper?

A. I should think so: it was also filled with sugar.

Q. There were coals under this (*the oil vessel*), that were actually on fire? A. Yes.

Q. This fire was lighted; did you take notice whether it had burnt the bottom of the iron vessel?

A. The bottom of the iron vessel was perfect, we afterwards boiled water in it, and found it quite perfect; I have seen a great many steam engine boilers leak worse than it does now, after having been taken out of the rubbish.

*Re-examined by Mr. SOLICITOR GENERAL.*

Q. The fire at the bottom of the retort, was the ordinary fire? A. Yes.

Q. No more coals than are usually applied? A. Yes.

Q. But in the other you put in coals to prevent the air passing?

A. The other was a larger fire-place, and it was crammed full of coals.

Q. And there was the sugar in the pan?

A. Yes, so I understood.

Q. Is that sufficient to account for the burning of the pan?

A. More than sufficient, for the pans in the other house were much worse burned, where there was neither coal under them, nor oil used.

Q. What kind of oil was it? A. It was whale oil.

Q. South whale oil?

A. I cannot say whether it was south or north, it was whale oil.

AARON MANBY, Esq. Sworn.

*Examined by Mr. SERJEANT LENS.*

Q. I believe you are an iron manufacturer? A. Yes.

Q. You are a partner in the Horsley Iron Company?

A. Yes.

Q. Did you construct the machine used on the plaintiffs' premises? A. Only the oil vessel.

Q. Did you attend to that vessel, and the manner in which it was worked? A. Yes.

Q. Was it made perfect, as far as you could judge?

A. It was.

Q. Were there any flaws about it, or was it perfectly complete? A. It was perfect and complete.

Q. Have sugar-houses been the objects of your attention?

A. No.



Q. It appears that after some working there had been some leakage, can you account for that in any way whatever, or is that the common effect of wear and tear?

A. The common effect of wear and tear;—it occurs with all steam boilers.

Q. If it is made ever so accurate, it will be subject, from wear and tear, to leak? A. Yes.

Q. None are made perfect?

A. They are made perfect;—this was made perfect, and tried before it left the work.

Q. But from wear and tear it ceases to be so? A. Yes.

Q. Is that to be prevented? A. I think not.

JAMES HARRIS, Esq. Sworn.

*Examined by Mr. Serjeant VAUGHAN.*

Q. I believe you are a sugar-refiner at Liverpool?

A. I am.

Q. Have you carried that business on for any time?

A. Fourteen years.

Q. What is the process that you use at your house in Liverpool?

A. We have used two processes;—the common process of boiling with the heat under the pan, and subsequently, the process invented by Mr. Wilson, of boiling by oil. This process which we adopted, of boiling by oil, was in an open pan, not in a close vessel, similar to that model.

Q. What was the inconvenience that you found resulting from that mode of using oil?

A. The great inconvenience was the smell that arose from the oil and the tallow.

Q. The smell was offensive?

A. Particularly offensive.

Q. With respect to the danger from one process and the other, which did you find most dangerous, the common process, or the using the oil in an open pan?

A. I conceive the danger was lessened by the oil process, from the circumstance of our being able to raise the sugar out of the heat in an instant.

Q. Was it so liable to boil over? A. We thought not.

Q. And you could separate it immediately?

A. We could separate the connexion between the oil and the sugar-pan by means of a lever.

Q. And your plan was an open oil vessel, not confined as this is?

A. It was like the pan in common use that we used before, and another pan immersed in it, as the common inkstand, where the vessel containing the ink is immersed in water.

Q. Was there any danger in the old process from the boiling over?

A. Great danger,—but not the only danger.

Q. What other danger?

A. That of boiling to excess, till the sugar becomes ignited by the heat below.

Q. Have you examined that model?

A. I have seen the model.

Q. Supposing that to be an accurate representation of the apparatus before they were burnt down, is that mode more dangerous than the process in use before?

A. I should say *infinitely* less.

Q. Is it less objectionable than your plan?

A. Very much so.

Q. Is it less dangerous? A. Much less.

Q. In your judgment it is safer?

A. I am perfectly convinced of it.

Q. I believe, upon making an alteration in your works, you made an alteration in your policy? A. Yes.

Q. I believe you have your policies with you?

A. I have one of them in my pocket; an application was made by myself to the agent for the offices to endorse the policy, allowing the use of tallow in boiling sugar.

Q. An application was made to the office to permit you to boil the sugar in this way? A. Yes.

Mr. Scarlett.—Was it made in writing?

A. It was not.

Mr. Serjeant Vaughan.—In consequence of that application was the alteration made; and is that the policy containing the alteration? A. No, this a new policy.

Q. Have the goodness to look at this? [*handing a policy to the witness*]. A. That is the policy.

Q. Look at the indorsement?

A. This is the indorsement: I obtained it from the office by means of the agent—"It is hereby declared, that the process of boiling sugar with tallow, between two pans, is allowed the 14th day of July, 1817."

Q. I believe you have another policy with the same office, and I will thank you to say, whether any alteration is introduced into the body of the policy?

A. Subsequently to this, a new policy was taken out for 2000*l.* and the process of boiling with oil is admitted.

Q. And introduced into the body of the policy? A. Yes.

Q. Just refer to that part of it in which this process is adverted to?

A. "The process of boiling sugar with oil, between two pans, allowed therein:" this is in a parenthesis.

Q. What is the date of that policy?

A. The 22d day of July, 1819: premium on the policy, sixteen shillings.

Q. What is the date of the other policy, on which there is an indorsement; they are both anterior to the policy we are now upon?

A. This first policy is dated the 31st of May, 1814.

Q. Is there any additional premium beyond what was required when the first indorsement was made? A. None.

Q. The second policy is effected on the same premium as the first was? A. Exactly.

Q. Did you pay any premiums for the indorsement of the first?

A. None: it was considered there was none necessary. The premium for boiling tallow by soap boilers, was much less than we were paying; and, therefore, it was considered our risk was not increased: this was the argument I used to the agent at Liverpool.

*Cross-examined by Mr. Serjeant HULLOCK.*

Q. You assured them the risk would be less than the old plan?

A. We did not: we had no means of assuring them, because it was a new thing to us.

Q. You did not represent that to be the fact?

A. I did not.

Q. What did you apply to them about?

A. Because there was an alteration from the mode in which we were boiling, when the policy was granted, I wished to be insured.

Q. You knew, at that time, you were paying more than than tallow chandlers and others.

A. The first question I asked was, what the tallow melters, boilers of oil, and others, were paying; and I said then, as we pay so much more, I presume our risk is not increased by boiling with oil and tallow: this was for their consideration.

Q. By the indorsement you have read, that is confined to the process of boiling by tallow between two pans?

A. Yes.

Q. What are the words? A. Tallow.

Q. Is that the process which you have continued from that time downwards? A. No.

Q. State the difference?

A. We used tallow for a certain time; we then thought that oil would be less offensive in the smell, and we made use of oil: the word oil is introduced into the policy.

Q. When did you make the transition from tallow to oil?

A. Perhaps in a month.

Q. You only used tallow for about a month?

A. About a month.

Q. Before this policy was effected, you had carried on the process of oil for two years? A. No.

Q. This policy is 1819?

A. The indorsement on the policy is July, 1819: the policy was dated 1814.

Q. You continued oil from that time to the present?

A. At present we are not using it.

Q. Have you abandoned it?

A. We have abandoned it for the present.

Q. What have you substituted in its place?

A. We have returned to the old method.

Q. When did you make that return?

A. I am not confident as to the time; perhaps six months after its first introduction.

Q. After trying this process, which is here designated by the process of boiling with tallow between two pans, for six months, you reverted to the old practice? A. Yes.

Q. You have no process of *this sort* in your sugar refinery? [pointing to the model]. A. We have not.

Q. What number of pans have you going on, on the old process? A. Four.

Q. You never had but one conducted by tallow?

A. We had three.

Q. And after that, through the medium of oil? A. Yes.

Q. All those three have been discontinued, and you have resorted to the ancient system? A. Yes.

Q. Are there a great many sugar-houses at Liverpool?

A. Not a great many.

Q. How many? A. About seven.

Q. Do they use this process of oil?

A. No, none of them, they are not at liberty to do it?

Q. For what reason.

A. The patentee has given us an exclusive right for Liverpool, to exclude every other person there.

Q. And after you had that exclusive privilege, you abandoned it? A. Yes.

*Re-examined by Mr. SERJEANT VAUGHAN.*

Q. The smell was extremely offensive?

A. A very great pungency.

Q. That, I believe, by the present patent is cured?

A. Yes, completely cured.

Q. But you are not at liberty to use the new patent?

A. Yes, I am.

Q. And perhaps you will not go on with the old process much longer? A. I think it is very likely I shall not.

Q. Do you know Mr. Unsworth? A. Yes.

Q. What is his process?

A. He has discontinued the trade of a refiner of sugar.

Q. In what manner did he carry on trade?

A. In the same manner that I do.

Q. By tallow between two pans? A. Yes.

Q. Do you happen to have been on his premises, and to have seen the process going on there? A. I have not.

Q. Then it is only from what you have been informed?

A. Certainly, Mr. Unsworth is a less practical man than myself, and therefore did not attend to it personally, and has since abandoned the business altogether.

Q. And you, I hope, will give up the old practice, and adopt the new one? A. Yes, I have no doubt but I will.

ANTHONY ROBINSON, Esq. Sworn.

*Examined by Mr. SERJEANT TADDY.*

Q. I believe you are a sugar-refiner? A. Yes.

Q. You have been so for many years?

A. Between twenty and thirty.

Q. I need not ask you, whether you are acquainted with the process of sugar refining, according to the old mode of doing it? A. Certainly.

Q. Is that mode attended with considerable danger?

A. It certainly is, it requires *incessant vigilance to prevent danger.*

Q. From what circumstances is that danger likely to arise?

A. Do you refer particularly to the process of boiling: I do not know that many houses have been burnt by the sugar boiling over, but it is liable to boil over, unless it is constantly attended to; there is a person constantly attending to it with the utmost vigilance.

Q. If it boils over, and comes in contact with the fire, it will produce that danger? A. Yes.

Q. Suppose it falls into the ash pit?

A. Danger still, because the ash pit is often filled with hot ashes.

Q. In your opinion, is there equal or less danger, in conducting it according to Mr. Wilson's method?

A. While such a vessel as this remains entire, there can be no danger at all, but I cannot speak to the comparative danger, because I am not acquainted with the heat, or the gas from oil.

Q. But while the vessel remains entire, there can be no danger?

A. No, and I think it requires infinitely much less vigilant attention to keep this right, than the old mode.

*Mr. Scarlett.*—Will it not be better to have a man who attended it?

*Mr. Serjeant Taddy.*—Have you boiled according to Mr. Howard's plan? A. No, never.

Q. Only according to the old plan?

A. Only according to the old plan.

Q. You have known many instances of sugar-houses being burnt down?

A. Many instances of sugar-houses, but I never could yet discover the cause of their being burnt, it is extremely difficult to find out that. I have made enquiry, but I never once ascertained the precise cause.

Q. Are the timbers in the different parts of a sugar-house, saturated with sugar, and in an inflammable state?

A. The floors are saturated with sugar, and the wood is uncommonly dry, from the perpetual heat necessary to forward the process; we cannot work without heat, heated air is essential to the process.

*Mr. Scarlett.*—We may take for granted that fire is in general the cause of their burning? A. I should think so.

Q. You do not know of any instance of their burning without fire?

A. I should leave that for such gentlemen as you to determine.

*Lord Chief Justice Dallas.*—That depends upon what sort of fire you allude to, the loss of the Ajax, many years ago, was one of that kind.

### BRYAN DONKIN, ESQ.

(*Chairman of the Committee of Mechanics, in the Society for the Encouragement of Arts, &c. &c.*) Sworn.

*Examined by Mr. STEPHEN.*

Q. We know you are a civil engineer, Sir? A. I am.

Q. After the fire, were you present when the surveyors attended from the fire-offices?

A. I was told they were surveyors.

Q. Were you present at the search for the oil vessel?

A. Yes.

*Mr. Scarlett.*—Is this to prove the same facts, because I do not mean to dispute them?

*Lord Chief Justice Dallas.*—Only to dispute other facts.

*Mr. Scarlett.*—The facts of the state of the boiler, I shall leave on Mr. Wilson's evidence.

*Mr. Solicitor General.*—As to that part, it will not be necessary to examine him, we wish to save what time we can.

*Lord Chief Justice Dallas.*—Never mind my time, or that of the Jury.

*Mr. Stephen.*—Are you acquainted with the business of sugar refining?

A. I cannot say I am intimately acquainted with it.

Q. Have you a sufficient knowledge of it, to say what the character of that apparatus is?

A. I am of opinion this is much the safer mode of doing it.

Q. Upon what evidence do you ground that opinion?

A. In the first place, because less fire is used.

Q. Do you know about how much less fire is used?

A. No, I have no means of trying, but I have reason to believe it requires less; and, in the second place, because the fire never comes in immediate contact with the vessel in which the sugar is boiled.

Q. And these were the principal sources of danger in the old system?

A. In the third place, there is a mode of stopping the heat, by stopping the progress of the oil through the vessel.

Q. Were there any means equally efficacious in the old plan?

A. None that I know of. Means have been employed to divert the heat by cutting off the draught; but as the employment of the fire under the pan heats the fire-place and the brick-work around it, the sugar takes heat from the brick-work.

Q. Then you consider the means used formerly much more dangerous? A. Yes.

Q. What were the dangers of boiling under the old system?

A. Upon the least negligence of the man, when the sugar is inclined to boil over, or when it becomes decomposed, an inflammable vapour would be produced, and take fire.

Q. At what heat would this take place?

*Mr. Scarlett.*—You have tried that, of course?

A. I have witnessed an experiment upon this effect; the sugar gave out inflammable gas at 344°.

*Mr. Stephen.*—Would that be a permanently inflammable gas?

A. I have not tried that, but I have no doubt it is.

*Mr. Scarlett.*—Do not tell us what you have no doubt of, if you have not tried it.

*Mr. Stephen.*—Do you know at what degree the oil will emit a permanently inflammable gas?

A. I cannot say that I know at what heat it will emit a permanently elastic inflammable gas; there is a difference between the vapour arising from oil under this plan, and permanent inflammable gas, the vapour is not permanent, it will be condensed by a cold air.

Q. Do you know whether it is a greater degree of heat than the sugar requires, to produce gas of that description?

A. Yes: oil emits neither vapour nor inflammable gas till it has arrived at a temperature far beyond that at which sugar will take fire.

Q. You say it requires a much greater heat, can you say what greater degree of heat it certainly would require?

A. It would certainly require  $580^{\circ}$ . I rather think that no permanent gas would be given out under  $600^{\circ}$ , but I do not know that to be exact.

Q. When oil has been long used, does its quality alter in this respect, so as to produce gas at an earlier period?

A. I believe the only difference would be this, that in all new oils a considerable quantity of water is contained, and in the vapour from it a considerable quantity of aqueous vapour is mixed, consequently it does not inflame so soon as the vapour from the older oil.

Q. Would the difference in that respect be considerable?

A. No.

Q. Suppose any inflammable gas generated in that boiler, is there any means by which it could pass away?

A. As this apparatus has been described to have existed previous to its destruction, it would have been emitted by that pipe which leads into what is called the steam-vent.

Q. It has been stated, that the lead of that pipe might happen to be melted under those circumstances, have you ever tried any experiment that would throw light on that subject?

A. I have ascertained that the vapour of oil above  $600^{\circ}$  will not melt the pipe. I placed a close vessel, with a lead pipe similar to that described, to carry off the vapour; I inflamed the vapour at the end of it, and it continued burning for half an hour, and the pipe was not hurt.

Q. What heat was that vapour?

A. I had not a thermometer in it, but I know it was above  $600^{\circ}$ .

*Cross-examined by Mr. SCARLETT.*

Q. You guess it was above  $600^{\circ}$ ?

A. I know it was, from the appearance of the oil in the vessel.



Q. As you were trying experiments, did you not take a thermometer?

A. I know it was.

Q. I never heard you examined upon chemistry before?

A. I am certainly not so intimate with it, as some gentlemen I see here.

Q. You have made experiments on oil with a view to this cause? A. Precisely so.

Q. Are you able to describe whether oil being heated for many successive days together, is much altered in its properties?

A. Two experiments were made at Mr. Cooper's laboratory. Into one of the vessels subject to one of the experiments, was put a quantity of oil which Mr. Wilson brought, stating it had been used at intervals for a considerable length of time; another vessel had a considerable quantity of new oil in it.

Q. You do not know whether one was new, or the other old? A. No.

Q. And that experiment you witnessed? A. Yes.

Q. And you are giving us the result now?

A. Yes, of part of them. I do not detail the exact difference.

Q. I observe, that in your evidence upon the danger, you apply yourself to the old mode of boiling sugar; you have given three reasons why the heating sugar by oil carried through the fluid is less exposed to danger, than heating it by a furnace under the copper; but you have not taken into account any danger from the heating of the oil itself?

A. I see no danger in it whatever.

Q. In your opinion, then, the boiling of sugar itself, in the ordinary mode, is attended with more danger than the heating of oil by this process? A. Precisely so.

SAMUEL PARKES, Esq. F. L. S. &c. &c. Sworn.

*Examined by Mr. SOLICITOR GENERAL.*

Q. You are an experimental and practical chemist, I believe? A. I am.

Q. The author of the Chemical Catechism and other works?

A. Yes.

*Lord Chief Justice Dallas.*—And of many other very learned works. He has often been examined before Committees of the House of Commons on important subjects, and is the author of the Chemical Essays, as well as the Catechism.

*Mr. Solicitor General.*—Have you attended to the process of that machine?

A. I have not attended to the process of boiling sugar as

conducted in that machine, but I have attended to the model, and I went twice to Whitechapel on purpose to examine this model, and I examined it with a great deal of care.

Q. Allow me to ask you first, as a general question, whether you consider what I will call the *old* mode of boiling the sugar for the purpose of refining, as more or less dangerous than this apparatus?

A. I have never spent much time in a sugar-house, but I have no hesitation in saying that the new mode must be attended with less danger.

Q. I should rather you would give the reasons, than that I should put the questions: for what reasons do you think it is attended with less danger?

A. On account of the fire not being immediately in connexion with the sugar-pan, and for similar reasons to those given by other witnesses; perhaps it may save time to say so.

Q. Were you in Court when Mr. Wilson gave his evidence?

A. I was.

Q. Did you hear his evidence?

A. I Did.

Q. Do you agree with what he stated?

A. In every thing, except as to the temperatures at which gas is given out by oils.

Q. You agree with Mr. Wilson, with certain exceptions?

A. I do.

Q. And you attended throughout to his evidence?

A. I did.

Q. And you do not agree with him as to the time when gas is given out?

A. This only respects the *old* oil; we agree very nearly as to the *new*.

Q. At what temperature does sugar emit gas?

A. I made an experiment with sugar for this particular cause: I mixed, in a small copper vessel, fifteen ounces of sugar, with five of water, which are the usual proportions; and the following appearances were observed:—When the sugar and water had acquired the temperature of 230°, Fahrenheit, it boiled rapidly; this it continued to do for about an hour, and, during that time, the thermometer remained stationary. Afterwards, as the water became nearly evaporated, the mercury moved slowly upwards till it marked 340°, then the sugar became black. I continued the heat until the temperature arrived at 370°, and then it burnt with a very strong and permanent flame, and, at length; the sugar remaining in the pan became carbonised like a coke.

Q. Would that emit gas from the surface, so as to ignite with the atmospheric air?

A. In my experiment it did not; but I attended an experiment at Mr. Cooper's, and the vapour did ignite.

Q. At what temperature? A. I do not know.

Q. You carried your temperature to  $370^{\circ}$ ?

A. Yes, and then took out the thermometer.

Q. With respect to oil, at what heat do the fixed oils boil?

A. I made two experiments upon oil; the first experiment was with five quarts of oil in an iron vessel, similar in form to a common digester.

Q. What kind of oil was that?

A. It was southern whale oil, and the top of the vessel was screwed tightly on.

Q. What heat did you apply to it?

A. I have here the scale of temperatures which the oil acquired. This was southern whale oil which I sent to a shop for; a thermometer was fixed in it, and it was put into a sand bath, and heat gradually applied to it. This heat was continued, and every ten minutes the temperature was noted down. At the same intervals, another person employed for the purpose, presented a lighted match to an orifice in the cover of the retort, which was left open for that purpose, to see whether any inflammable gas was given out. This trial was made every ten minutes, and frequently at less intervals. When the oil acquired the temperature of  $350^{\circ}$ , a vapour was perceived to arise from the retort, but this was aqueous, and not inflammable.

Q. That was new oil?

A. Yes. This uninflammable gas continued to be given out till the thermometer arose to nearly  $590^{\circ}$ , and then an inflammable vapour was given out, but it was a very feeble lambent flame; and the moment the lighted match was withdrawn the flame went out.

Q. That you would not call a permanent gas?

A. I beg pardon—it might be a permanent gas, though the flame was not permanent.

Q. What was the lowest temperature at which it did take fire with a match?

A. Inflammable gas was first given out at  $586^{\circ}$ , but the flame was not permanent.

Q. Five hundred and eighty-six degrees was the lowest temperature at which inflammable gas of any description was given out? A. Yes.

Q. But the flame of that was not permanent?

A. It was not.

Q. If you applied a match to that it would burn, and if you withdrew it, it went out?

A. Yes; and at 590° it presented the same appearance, but at 600° it continued to burn.

Q. During that time, there was a continually increasing heat, arising from the causes you have mentioned?

A. There was.

Q. Would it be easy, by mere negligence in attending the fire, to get the oil up to a temperature of 600°?

A. I think not.

Q. Would it require a considerable time to do it, in your judgment?

A. I should be glad to know the size of the fire-place at the sugar-house?

*Mr. Wilson.*—The vessel itself was nine feet long, three feet wide, and eighteen inches deep; the size of the fire was from twenty to twenty-four inches wide, the length I cannot say.

*Mr. Parkes resumed—*

A. One fire made under it, certainly, would not have effected it, because it would not have held fire enough; no *one* fire that could have been made in such a fire-place, could have produced that effect.

*Mr. Solicitor General.*—So that negligence, in attending the fire, could not have produced it?

A. Certainly not, in my opinion: but if a man made up a large fire, and attended it with due vigilance, and had stoked it, and given an access of air through the bars, he might have increased it; but I think *one* fire, with all possible care, would not have brought the oil up to 600°.

Q. But if a man had exerted himself very much in a certain time, he might have effected it? A. Certainly.

Q. But it would have required a considerable time?

A. I think it would.

Q. Supposing gas to be formed there, would there be any danger of its coming into the room so as to explode?

A. I conceive no danger could arise from it.

Q. Having said generally that you agree with the evidence of Mr. Wilson, do you think that apparatus at least as safe as the other apparatus in use before?

A. There is hardly any question respecting it—it must be much safer; and every man who has attended to chemical operations must say so: because, in one case there is a fire under a very combustible substance, and in the other case there is no fire.

Q. You heard the situation of the apparatus, after the fire was over, described. Do you suppose the principal fire was where the apparatus is, or at a higher point? You remember the account of the fused pots, and other circumstances?

A. Not having seen the building, I can hardly give an answer to that question; but I cannot conceive any possibility by which a fire could have arisen from this apparatus.

*Cross-examined by Mr. SCARLETT.*

Q. I observe the Solicitor General has asked you to give the result of experiments with fresh oil, what was the result of the experiments on oil that was not fresh; have you made experiments on oil that had been previously used?

A. The experiments I made on old oil, were on oil I sent for to Mr. Wilson; I took the precaution of desiring him not to send it by a stranger, but to bring it himself, in order that I might be sure it was oil of that description; and on that I made experiments on a subsequent day.

Q. What was the result of that?

A. The result was different—with new oil I did not observe any inflammable vapour till  $586^{\circ}$ , but the gas from the *old* oil was inflammable at  $508^{\circ}$ ; it was this circumstance that I referred to, when I said my experiments differed from Mr. Wilson's.

Q. You found, that from the oil he brought to you, and which, he said, had been used for some time, the inflammable gas was produced at  $508^{\circ}$ ?

A. Yes, and not before: because lighted matches were put to it every ten minutes, and sometimes at less intervals. This kind of gas continued to be given out until the thermometer arose to  $590^{\circ}$ , and although this vapour did take fire on the application of a lighted match, it immediately went out on the match being withdrawn: indeed, it could hardly be considered to be a flame; it was the slightest and most lambent kind of flame I ever saw; it did not require to be blown out, for immediately you withdrew the match, it went out. The orifice from whence it arose was considerably heated, and, therefore, I confess, I was surprised the flame did not continue.

Q. When did it give out a permanently inflammable vapour?

*Lord Chief Justice Dallas.*—At  $600^{\circ}$ , he says.

*Mr. Scarlett.*—That was the *new* oil:—when did the old oil give a permanently inflammable gas?

A. At  $590^{\circ}$ —a difference of ten degrees: the fresh oil gave no permanently inflammable vapour till  $600^{\circ}$ ; whereas the other gave it out at  $590^{\circ}$ .

Q. Have you ever tried experiments with oil that you yourself had used for many successive days?

A. I have not, as to its giving out gas.

Q. Have you ever had an opportunity then, of ascertaining whether, in proportion to the length of time that the oil is used, it gives out gas with more readiness?

A. I have not; I never made any series of experiments upon *old* oil but this once, and I have no doubt of that having been old oil, because it was very high coloured, and from the difference of time at which the inflammable vapour was given out. It was, indeed, so different from the oil which I purchased, that I could have no doubt that it was old oil.

Q. But how old, you know nothing about?

A. No, except from the evidence of Mr. Wilson, which I have no reason to doubt.

Q. Have you made any experiments on the weight of gases emitted from oil at various temperatures?

A. I have not, but I have made experiments as to the quantity of gas given out.

Q. Can you inform the Jury, whether the permanently inflammable gas that is emitted from oil, is heavier, or lighter, than the atmosphere?

A. Not from experiments with that particular gas.

Q. Nor of the vapour?

A. No, but the vapour was chiefly aqueous, by its condensing and running down the inside of the vessel in which it was received.

Q. Did you observe when the gas was emitted, was there any colour?

A. No, not till it was in flame: it was then of the usual colour of carburetted hydrogen gas.

Q. What was the quantity of old oil that Wilson brought to you?

A. I do not exactly know the quantity, because the whole was not used; it was brought in a large can, sealed up.

Q. What quantity did you use?

A. About five quarts and a half: it was necessary to be particular, in order that it should rise to the bulb of the thermometer, because the thermometer had a piece of brass attached to it, to prevent its sinking too deep. In the first experiment I bought six quarts of oil, I did not measure it, but I used all except about a pint; and in the last experiment I used about the same quantity, because it rose in the same vessel to the same height.

Q. Are you able to inform the Jury, whether the oil itself, after being used for a very considerable time, and made hot every day, does not become much more inflammable than in its original fresh state?

A. This which I tried was more inflammable: do not mistake me, I mean it inflamed at a lower temperature.

Q. The oil gas? A. The gas.

Q. Oil itself will burn?

A. Yes, when a wick is put into it.

Q. I want to know whether you have ascertained whether it burns with more or less readiness, from being more heated?

A. It will burn with more readiness the *newer* it is, all our experience tells us that; and that old oil is not so good for lamps as new oil.

Q. But our experience tells us the oil requires to be heated to a certain degree, before it will burn at all? A. Certainly.

Q. If a heat from  $300^{\circ}$  to  $400^{\circ}$  be repeated every day for months together, on a large mass of oil, will it become more or less inflammable; have you made any experiment on that?

A. I have not: but we know that in the instance of a chamber lamp with a pith wick in it, the pith wick will burn well if the oil be good, but the oil without the wick will not burn. I mention this to shew that oil itself is not very inflammable; I should conceive, not half so inflammable as sugar.

Q. You have mentioned, that by placing the fresh oil in a sand bath, and the gradual application of heat to it there, you brought it to  $600^{\circ}$ ? A. Much higher.

Q. Can you tell us what time it took to bring the old oil to the same degree of temperature?

A. I can: but the experiments are not conclusive, because the fires were made in a different way; the first took from ten to four o'clock; and in the second experiment, I directed the fireman to heat the sand bath *before* the oil was put in, and the table of temperature does not begin till  $200^{\circ}$ , whereas in the former experiments we began at  $56^{\circ}$ .

Q. Suppose there is one gallon or mass of oil that has been heated for every day in a week and allowed to cool again, and another heated for a month every day and allowed to cool again, are you able to inform the Jury which of the two would come to a certain degree of temperature with the smallest degree of heat?

A. I have made no experiment of that sort; but there was a remarkable thing respecting the evolution of gas, which I noted in my experiments with the old oil (for I did not collect the gas from the new oil);—when the oil was heated to  $590^{\circ}$ , it gave out eight cubic inches of gas only in four minutes, but when heated to  $620^{\circ}$ , it gave out 32 cubic inches in one minute.

Q. So that its activity increases in a greater ratio than in proportion to the heat?

A. At  $620^{\circ}$  it gave out that quantity of gas, but that is not a rapid evolution of gas.

Q. It is more rapid in proportion to the heat?

A. There is a difference of from thirty to forty degrees in the temperature.

Q. At the lower temperature it gave eight cubical inches in four minutes?

A. Yes; and in the other case 32 cubical inches in one minute.

*Re-examined by Mr. SOLICITOR GENERAL.*

Q. At 590°, you say it was, that the oil gave out a permanently inflammable gas? A. The old oil.

Q. The other was at a higher temperature?

A. Yes, at 600°.

Q. If the sugars were heated any thing like that of the oil in the vessel, what would be the effect on the sugar?

A. It would carbonize the whole of the sugar long before.

*Mr. Scarlett.*—That we agree in, provided it got there.

A. I conceive, if it had been heated to 400°, it must have carbonized the sugar.

*Mr. Solicitor General.*—So that it would be pretty apparent to any person attending the apparatus?

A. It must have boiled over unless he had ordered the communication with the pump to be cut off. It appears to me that that is the great advantage of this apparatus, because if there is any danger of its boiling over, the man has only to order the pump to be stopped, and there is an end of it.

*Mr. Scarlett.*—And if it boils over before the pump begins, of course it cannot get to the sugar?

A. I should think not.

*Mr. Solicitor General (To Mr. Wilson.)*—Mr. Parkes has spoken of some oil you sent to him as old oil,—what oil was that?

A. It was whale oil which had been used for at least a period of two years, about every second day.

Q. In what way?

A. Heated in a vessel which I have, about half the size of this.

Q. Was it so done with a view of making experiments?

A. Making all the experiments I have spoken to.

*Mr. Scarlett.*—For how long every day?

A. Sometimes we boiled large quantities of sugar in it for six hours a day, at other times not an hour a day; sometimes two hours, and at other intervals.

**WILLIAM THOMAS BRANDE, Esq.**

*(Secretary of the Royal Society, &c. &c.) Sworn.*

*Examined by Mr. SOLICITOR GENERAL.*

Q. You are Professor of Chemistry at the Royal Institution?

A. Yes.



Q. Have you looked at the apparatus now before you?

A. Yes.

Q. Have you considered the subject with a view of giving evidence here to-day? A. Yes.

Q. Have you made any experiments with that view, or have you reverted to any old experiments?

A. Yesterday I made a few experiments. Finding I was necessitated to come here, I thought it better to prepare myself on one or two points.

Q. Do you consider there is more or less danger in the new apparatus?

A. As far as my experiments go, which were on a small scale, I should say this apparatus was less dangerous than the old mode.

Q. Upon what grounds is that opinion founded?

A. I placed a vessel of oil over a fire, and a small pan of sugar in it, there was a thermometer in the oil vessel, and when the oil obtained 300 or 400°, the sugar blackened, and I applied a candle to it, and it burnt; I applied a taper to the oil, and found that it was giving no gas, from which I conclude that sugar gives out gas at a lower temperature than the oil, and consequently that the oil is not so dangerous as the sugar.

Q. Do you know at what time the oil gives out inflammable gas?

A. I think at not less than 600°: I then took the thermometer out for fear of breaking it, and, a little after, I observed it gave out inflammable gas, but in a very small quantity.

Q. Was that a permanently inflammable gas, or not?

A. I consider it was a permanently elastic inflammable gas.

Q. If gas were generated in that oil vessel [*pointing to the model*], would there be any danger to the apparatus from that circumstance? A. I should imagine not the least.

Q. Is any gas that you have ever seen, generated from oil as heavy as the atmospheric air?

A. No, all lighter: the gas which oil produces when it is burnt, is heavier, but it is not then an inflammable gas; and no inflammable gas produceable by oil, is heavier than atmospheric air.

Q. Suppose the quantity of gas which the oil in that vessel could create under the circumstances of this apparatus, were introduced into the fill-house, would it be such a proportion as to take fire?

A. That supposes a thing which could not exist, the perfect air-tightness of a fill-house.

Q. Then, taking the situation of the things as they really

are, supposing gas to be produced by an intense fire under the oil, and that gas to come into the fill-house, in your opinion, would an explosion take place?

A. Certainly not: I think the gas would have gone up the steam-vent.

Q. Do you happen to know, whether oil that has been heated from day to day, gives out gas at a lower temperature?

A. I do not know.

Q. Do you know whether it is more inflammable if it is afterwards suffered to cool?

A. I do not know; I have made no experiments upon it?

Q. Have you any means of knowing about it?

*Mr. Scarlett.*—He has made no experiments.

*Mr. Solicitor General.*—Do you agree with Mr. Wilson in the evidence he gave, or if you differ, in what respect?

A. In all the parts of his evidence that I am capable of giving an opinion on, I agree with him.

Q. You heard the description of the oil vessel when the rubbish was cleared away, in your judgment, was the fire in the neighbourhood of that vessel, or in higher places?

A. From examining the boiler and the sugar-house, it was my impression it was more probable it should have broken out at a higher place than the boiler.

*Mr. Scarlett.*—This is asking a witness, who knows nothing about it, as to the cause of the fire.

*Mr. Solicitor General.*—The gentleman had an opportunity of hearing, and of judging the situation of the apparatus after the fire.

*Mr. Scarlett.*—It has been over-ruled.

*Lord Chief Justice Dallas.*—This is said to be much safer. These gentlemen have given you their chemical reasons in detail.

*Mr. Scarlett.*—I wish to state that I have a body of very full and complete experiments upon the subject, not left to the conjecture of any man of science.

*Cross-examined by Mr. SCARLETT.*

Q. I take for granted you and I shall agree that the man who was attending to the fire at the time it broke out, is probably the best judge of the immediate cause of it?

*Mr. Solicitor General.*—That is imitating my errors.

*Mr. Scarlett.*—I retract, my Lord. I will put this case: Supposing the fire, when first observed, had been shewed to break out in that steam-bin, which appeared at once all in a blaze, what, in your judgment, would be the cause of it, knowing, as you do, the operation of gas, and from your chemical information?

A. The whole of this is called the steam-bin, I imagine: if I had seen the fire there first, I should have concluded something had taken place there to produce it.

Q. Could you judge, from the apparatus, what it would have been?

A. No, if there had been a possibility of any inflammable matter passing into the steam-bin, I cannot conceive it could have lodged there with that aperture; if any thing had closed the aperture, then it might have happened.

*Re-examined by Mr. SOLICITOR GENERAL.*

Q. If there were several gas-lights in the fill-house, and they had not been turned off, might any thing of the kind have taken place from that?

A. I should imagine that every thing would have gone out.

**FREDERICK ACCUM, Esq.**

*(M. R. I. A., &c. &c. and Lecturer on Chemistry,  
at the Surry Institution), Sworn.*

*Examined by Mr. SERJEANT LENS.*

Q. Have you had occasion, or have you, in fact, made experiments for the purpose of ascertaining at what temperature oil will emit permanent inflammable gas? A. Oil emits—

*Lord Chief Justice Dallas.*—Had not you better distinguish between old oil and new oil?

*Mr. Serjeant Lens.*—Were the experiments you are going to speak of, made with new or old oil? A. Both.

Q. In the experiments you have made, you found oil emit permanently inflammable gas at 600°? A. Yes.

Q. Was that with the old or the new oil? A. New oil.

Q. Have your experiments been uniformly that?

A. It never gave out gas at a lower temperature than 600°.

Q. Have you made many experiments to reduce that to a moral and reasonable certainty?

A. I have done so for various purposes.

Q. And you have not found it produce gas permanently at less than 600°? A. No.

Q. Does it take any considerable time in the application of the heat, to produce that degree of heat?

A. It depends upon the quantity I heated.

Q. You have seen the model, and the experiments there made, with a fire that appears to be under that pan; using that fire for the purpose, as much as possible, would it take any considerable time to raise it to that temperature?

A. If it contains 100 gallons, it would take a man at least eight or ten hours.

Q. If he was sedulously attending to it?

A. If he was called on to do it, he could not do it in less time.

Q. Is it possible to produce it in twenty minutes, or a quarter of an hour?

A. No, with such a quantity of oil, it would be impossible.

Q. Have you observed any material difference between the new and old oil, and what is the result of the application of old oil?

A. I made some experiments with old oil, which was nineteen months old, that is to say, it had been applied for purposes similar to this, by a calico bleacher.

Q. You did not make——

*Mr. Scarlett.*—Does he know the fact of its being so heated.

*Lord Chief Justice Dallas.*—Unless he knows it himself, it is nothing.

*Mr. Serjeant Lens.*—How do you know that the oil you used was old oil?

A. I know the manufacturer, and old oil is nearly of the consistency of molasses when warm, and when cold, it was almost solid; I could almost stand on it.

Q. Then though the particular date of it cannot be ascertained, there is a visible and palpable distinction between the old and new? A. Yes.

Q. Then, without ascertaining how old this might have been, can you say these experiments were made from old oil?

A. I have not the least doubt about it, I watched the operation, and therefore I saw the oil corked up.

Q. And with that the experiments were made? A. Yes.

Q. By old oil, do you mean oil kept a certain time, or oil that has been heated to a certain degree, and then kept, and used again, and so on?

A. This oil which I speak of now, had been in constant use three times a week.

*Mr. Scarlett.*—How does he know.

*Mr. Solicitor General.*—Because he was employed to watch the manufacture.

A. I was professionally employed to watch this mode of heating.

*Mr. Serjeant Lens.*—How do you know that this oil had been used again and again,—was it apparent from any thing in itself, or from your knowledge of the oil?

A. I was called on to visit this manufactory repeatedly, and I found the apparatus in the way I left it, and I have no reason to suppose I should be imposed on by the manufacturer.

*Lord Chief Justice Dallas.*—You can distinguish old oil that has been used, from new oil?

A. Certainly; oil that has been heated from time to time becomes more dense; at last it becomes almost solid.

*Mr. Serjeant Lens.*—What difference did there appear between the experiments on the old and new oil?

A. That gave gas at  $460^{\circ}$ .

Q. What kind was it that was evolved at  $460^{\circ}$ ?

A. A gas similar to the common gas used for illumination.

Q. Would that be permanently inflammable gas?

A. Yes it would.

Q. Seeing the formation of that model in the way in which the steam and other things are conducted, suppose for a moment gas to have been generated and produced, what would become of it,—would it escape?

A. It would go out of the place;—it is impossible to confine gas in that manner;—gas can only be confined under a cover;—if gas entered into this room, it would ascend and collect in that cupola, and there being no opening, it would remain.

Q. But if there was an opening it would go out?

A. Yes, and the heavy air fall in and displace it.

Q. Would that escape in spite of the heavier air, and the heavier air come in its place?

A. When the lighter body floats up, the heavier one supplies its place.

Q. The heavier body does not keep down the lighter one?

A. No, they must exchange places; if the vessel were full, the heavier body could not come in.

*Foreman of the Jury.*—Are all inflammable gases lighter than common air? A. Yes.

*Mr. Solicitor General.*—And therefore this gas that was made from this old oil was lighter?

A. Considerably lighter than common air.

Q. Do you know whether any inflammable gas is produced not lighter than atmospheric air?

A. I have reason to believe they all must be lighter.

Q. Is any gas produced that is not lighter, which is not inflammable?

A. There are many gases considerably heavier.

Q. But none of those which are inflammable are heavier?

A. Exactly so; they extinguish inflamed matter.

Q. You have seen this model, and you have seen and known the common way of heating sugar; in your judgment, comparing the effect of one and the other, which is the safer or the more hazardous mode?

A. This is by far the least hazardous.

Q. Why is this less hazardous?

A. I placed two vessels, one of them containing sugar, and the other containing oil, upon a quantity of quicksilver: they were placed under similar circumstances; when the sugar had acquired a temperature of  $350^{\circ}$ , the approach of a lighted body set it on fire: now, as in this case, the operator has the command of his heat, which he has not in putting the fire under the vessel, I certainly have reason to believe that this may be called less hazardous.

Q. Is that your conclusion and your judgment from the observations you have made? A. Yes.

Q. With regard to the common effect of the sugar boiling over in the ordinary mode,—is that very hazardous?

A. Extremely so; for of all bodies, sugar gives the largest quantity of inflammable gas.

Q. In this mode, the fire is not under the sugar at all?

A. Not at all.

Q. In that respect, is it in your judgment less hazardous than the ordinary mode? A. Yes.

Q. According to your judgment, could the oil in the iron vessel, and in the way it appears to have operated there, have taken fire?

A. No, that would have been physically impossible.

Q. The way it would take fire would be by raising it to  $600^{\circ}$ , and then by its rendering permanently inflammable gas it might take fire?

A. Yes, but that would go up the chimney.

Q. The oil itself would not take fire? A. No.

Q. Suppose, from any extraordinary circumstances, gas should be capable of being produced so as to get into the room, what would be the effect of it?

A. It could not collect there, it is impossible;—from experiments that have been made of filling-rooms, it could not be done any more than this room could be filled with water, as this is situated; such an occurrence could never take place; if there was a hole in the vessel, and gas was streaming out at the rate of 100 cubic feet in a minute, it could not accumulate in the house,—it would be impossible.

Q. Would it escape?

A. It could not be collected at all in a house.

Q. It could not be confined in that house, constructed as it is? A. No.

Q. Then unless it were detained there, could it create mischief from taking fire?

A. If a quantity of gas was kept and mixed with atmospheric air, then by the approach of light it would take fire.

*A Juryman.*—But the building must be air-tight?

A. Yes, where a given quantity of gas could collect, and remain quiet and undisturbed, then it would take fire;—that accident happened lately.

*Mr. Serjeant Lens.*—But in this fill-house, constructed as it is, that could not happen? A. No.

Q. What would be the effect in such a case as you have put;—supposing it to have been inclosed, and gradually increasing, would there be an explosion?

A. The explosion might be heard all over London.

Q. Would it leave any visible effect?

A. Every thing would shew the effect of being suddenly torn.

Q. Would that oil vessel have remained?

A. It would be lacerated to pieces.

Q. It could not have remained in the way in which it was?

A. No.

Q. That is inconsistent with their having been an explosion in the way you have described? A. Yes.

*Cross-examined by Mr. SCARLETT.*

Q. Was the fresh oil you got tried recently?

A. The experiments I made were on oil I got from Mr. Wilson.

Q. Were they recently made?

A. They were made within this month.

Q. Who gave you the oil?

A. I received it from Mr. Wilson.

Q. Is any oil to be had that is unadulterated?

A. I have not a doubt there is.

Q. Then there is pure oil to be had? A. I hope so.

*Mr. Solicitor General.*—People do not eat and drink whale oil? A. No.

*Mr. Scarlett.*—You got from your friend the bleacher some old oil? A. Yes.

Q. When did you make the experiments upon that?

A. Twelve months ago.

Q. And you found that emitted inflammable gas at 460°?

A. Yes, and I repeated the experiments last week.

Q. And it succeeded in the same way?

A. Precisely the same.

Q. Could you tell how old the oil was by looking at it?

A. I believe I could; I have reason to say so.

Q. Tell me how old that is? [*producing a pot of oil.*]

A. Is this whale oil or linseed oil?

*Lord Chief Justice Dallas.*—Be sure it is oil first.

*Mr. Scarlett.*—Is it oil?

A. Unquestionably it is oil.

Q. It is whale oil. A. Yes.

Q. How old is it?

A. It depends on what circumstances it was boiled under. The oil I spoke of was in a close vessel, but I have reason to state, oil boiled in an open vessel behaves quite differently.

Q. Suppose it was boiled in a close vessel, how then?

A. Then I should think that is not less than six months old, meaning to say, that that oil had been used at least twice a-week.

Q. In your opinion, supposing that had been boiled in a close vessel, it has been used twice a-week for six months?

A. I should think so, without any contact of air.

Q. Supposing it was heated in an open vessel, how then?

A. It would become quite different then, it would become of the consistence of plaster, and much stiffer than this: so stiff, that if you were to put your finger in it, it would draw out in strings.

Q. At what heat? A. At 400° or 500°.

Q. Suppose that is heated in an open vessel, how old is it?

A. From oil I have had an opportunity of examining which had been heated in a vessel entirely closed, not in contact with air, after the oil had been heated six months it was stiffer than this; but if I take oil and keep it hot for twenty-four hours, I know that that oil acquires a consistency widely different from this.

Q. How old is that oil, supposing it is heated in an open vessel?

A. I cannot say at all, it depends on such a variety of circumstances; if the oil is in a shallow vessel, one hour will effect what in another vessel will require six hours.

Q. Supposing this to have been heated in such a vessel as this? A. That is not a close vessel.

Q. How long must this have been heated?

A. I do not know; my experiments were on oil used in a close vessel.

Q. This is not a close vessel? A. No.

Q. Have you made any experiments to ascertain whether the degree of heat necessary to produce a given temperature in oil, varies with the former application, of heat to the oil, or not? A. Yes, it does.

Q. Suppose some oil had been long heated, and other fresh, which would arrive at a given temperature first?

A. The oil that had been heated before.



*Lord Chief Justice Dallas.*—Independent of that, does oil, by heating, become decomposed?

A. Immediately that it acquires the temperature of boiling.

*Mr. Scarlett.*—I put a case of a pot of oil that has been heated every day for months, and another quite fresh, and you want to get them to a certain temperature, which comes to it quickest?

A. I do not understand the question. Supposing I take two vessels, one of old oil, and the other new, and place them in the same temperature, which would become heated quickest? I suppose the old oil; because the new oil contains mucilage and water, this is carried away before it acquires heat, therefore I have reason to believe, that oil which has been deprived of these matters that would carry away a certain portion of heat, will become hot first.

Q. Is there any time when you can say all the water is expelled?

A. That depends upon circumstances.

Q. Then the oftener the oil has been heated, the hotter it grows, with a given fire?

A. It does not grow hotter.

Q. But it comes to a given temperature quicker?

A. Certainly: oil that is deprived of those materials would do so, because in the other case it is a compound of oil, water, and mucilage, which are not the same bodies; but when the water is gone, the heat is applied to another substance.

*Re-examined by Mr. Serjeant LENS.*

Q. When the oil is old, and these aqueous matters have been dispersed, the fire applies itself to heat the oil.

A. Precisely so.

Q. So that old and new oil are like old and new wood, the old wood burns immediately, and the other does not?

A. Yes.

*Lord Chief Justice Dallas.*—Not only that, but the aqueous matter takes away part of the heat.

A. Yes, it forms steam.

*Mr. Serjeant Lens.*—What was the oil you used, whale oil, or linseed oil?

A. Whale oil.

Q. Were the experiments at the calico printers made with whale oil?

A. Yes.

Q. I understand you that there is a considerable difference in the appearance of oil frequently used in this way, and that to which heat has never been applied before?

A. Very much so.

Q. When it has been heated to a high temperature?

A. It becomes black.

*Mr. Solicitor General.*—You talk of oil that has been burnt?

A. It becomes a different substance.

*Mr. Serjeant Lens.*—When it has been boiled again and again, it is palpably different? A. Yes.

Q. So that you could not mistake one for the other?

A. No, I could not.

*Mr. Solicitor General.*—Supposing there to be no material alteration in the appearance of the oil itself, would there be any material alteration with respect to the facility of acquiring temperature? A. No, there would not.

WILLIAM ALLEN, ESQ. F.R.S. &c. &c. Affirmed.

*Examined by Mr. Serjeant VAUGHAN.*

Q. I believe you have, for some years, applied your mind to chemical subjects, and have given lectures on that science?

A. Yes, at Guy's Hospital I have taught chemistry for sixteen years.

Q. Have you looked at the model before us? A. I have.

Q. Having inspected that model, are you of opinion that the process employed there is less dangerous than the process previously in use to boil sugar?

A. I have considered the model with much attention, and I am decidedly of opinion, that the method described in the model before us, is by far the safer plan, beyond all comparison.

Q. State, shortly, your reasons for that opinion?

A. It must be quite obvious to all those who know what an inflammable substance sugar is, and at how low a temperature, comparatively, it takes fire; that if a fire is lighted immediately under the pan, there will be a most imminent risk of its boiling over, and if it goes into the fire, conflagration must be the consequence: then, I consider the apparatus before us as obviating a great part of the danger; we merely want a heat of  $240^{\circ}$ , or  $250^{\circ}$  for sugar, and here you heat oil to between three and four hundred degrees; it is made to circulate through a copper tube, and gives the heat in the safest, possible manner.

Q. Is there any other reason than that that you have stated, for thinking it is safer than the old process?

A. I think that is one of the principal reasons for considering it safer, that the sugar may be brought to boil with the application of heat, that can produce no danger with respect to the sugar.

Q. Did you make any experiments as to the degree of heat necessary to produce inflammable permanent gas from oil?

A. I recollect perfectly well, in the course of my experiments, though not lately, having been absent on the Conti-

nent two years and a half, to have observed that whale oil will not give out any permanently elastic gas, until it very nearly approaches the temperature of 600°, of Fahrenheit; it is true, it will give out a little vapour, but that is very often water which has been entangled with the oil; but the point at which permanently elastic gas is given out, is about 600° of Fahrenheit.

Q. Do you make any distinction between the new and the old oil generating that elastic gas? is it produced more readily from one than the other?

A. I think the difference, from the experiments I have seen performed is, that from the old oil the gas would begin to be given out at a little lower temperature than from the new oil; but the difference in this respect, as far as my experiments go, is very small indeed, and amounts to a very few degrees of Fahrenheit's scale.

Q. Have you heard Mr. Accum's evidence? A. Yes.

Q. Do you agree with him, or in any manner differ from him?

Mr. Scarlett.—He has stated a difference.

A. There were many circumstances in that evidence I should not choose to give an opinion upon—for instance, the pot of oil that was introduced.

Q. Attending to the construction of that model, and observing the vent-pipe, or whatever you call it, would any danger arise from any gas that would be generated in that machine?

A. My opinion is, that no danger at all would arise. If the person left the fire he had made, and left the whole apparatus to its fate, not the least accident would follow from that. If it did heat the oil (and I do not believe it would be possible to heat it without giving more fuel than that fire-place will bear) to such a degree as to produce permanent and inflammable gas, it would be carried off by that tube.

Q. But supposing he was industriously mischievous, how soon could he produce any mischief from the activity to which the fire could be increased?

A. In the first instance, it would take him a great many hours to bring it up to 700° of Fahrenheit, at which the oil would be decomposed; it would not be decomposed entirely, and in proportion as it was decomposed, it would find its way up the steam-vent, and out of the house. I have not the smallest idea of its being possible to accumulate it; that is my opinion, from having seen how slowly oil heats up by fire.

Q. The degree of heat you mention, would be unnecessary for the purpose of boiling sugar?

A. If you heated oil to 600°, and it was circulated through the sugar, it would be at the great risk of decomposing the sugar, and would produce inflammable gas from the sugar.

Q. The sugar would be decomposed before the oil came to 700°?

A. Yes.

*A Jurymen.*—What is fixed oil?

A. The essential oils are raised by distillation unaltered, but the fat oils cannot be raised in distillation without becoming totally changed, therefore they are called fixed oils; and it requires particular management, and a great deal of heat, to produce the oil of Dippel.

Q. Attending to the construction of the machinery, and the construction of the house, in your judgment, could any explosion have taken place, to destroy this machinery, by too much gas being generated?

A. Certainly not, from any gas that apparatus was capable of producing: I consider the gas from the lamps was ten times more dangerous than the oil apparatus.

Q. You have heard the state of the machinery described when it was dug out?

A. I visited the ruins two or three weeks ago, and examined the boiler, to see if there was any rent, fissure, or any appearance of its being torn by explosion; but so far from that, it was indented by the rubbish, but not the least fissure, or symptom of explosion was visible.

Q. Could there have been an explosion without its being manifest?

*Lord Chief Justice Dallas.*—O dear, that is not necessary.

*Mr. Solicitor General.*—Will your Lordship allow me to ask Mr. Parkes a question—one of the Jury has asked the distinction between fixed and essential oils?

*Mr. Parkes.*—Fat oils, either linseed oil, whale oil, olive oil, rape seed oil, and several vegetable oils, are called fixed oils.

Q. These boil at a high temperature?

A. Yes.

Q. Why are they called fixed oils?

A. They are called fixed oils because they will endure a high temperature, and may be boiled in an open vessel with very little danger; they are also called fixed oils, to distinguish them from essential oils; such as oil of peppermint, oil of juniper-berries, oil of turpentine, bergamot, &c. none of which can be heated, even in a close vessel, without danger.

Q. Those oils go off very rapidly, and are called volatile oils?

A. Yes.

Q. The others are called fixed oils?

A. Yes: if a drop of essential oil was dropped on this white paper, and the paper gently heated, it is so volatile that

it would not leave a stain upon the paper. It appears to me, that there are no two substances in nature more different than fixed oils and volatile oils; therefore they ought not to be confounded together.

Q. They are alike only in name? A. Yes.

JOHN THOMAS BARRY, Esq. affirmed.

*Examined by Mr. SERJEANT TADDY.*

Q. Are you a practical chemist? A. Yes.

Q. Have you had an opportunity of examining the model?

A. I have.

Q. In your opinion, is the mode of sugar-refining carried on as there represented, more or less dangerous than the common course?

A. I have made a few experiments, the first, to determine the heat at which sugar was liable to boil over; the second, to determine the heat at which oil is liable to boil; another to determine the heat at which sugar will take fire in a pan, on the application of a candle; another to determine the heat at which oil will take fire, by the like application of a candle.

*Lord Chief Justice Dallas.*—Do you mean in flame, as distinguished from common combustion?

A. Yes, the sugar was found liable to boil over at a temperature of 250° Fahrenheit; the oil boiled at a temperature higher than Fahrenheit's thermometer goes to, I suppose at least 650° or 700°; the sugar took fire at a temperature of 370°, by the application of flame; the oil took fire at a temperature higher than Fahrenheit's thermometer goes, I suppose near 700°.

Q. Did you proceed to examine, at what degree a permanently inflammable gas was emitted?

A. Yes, I found it was given out, on the first experiment, at a temperature of 580°, in very minute quantities, a bubble now and then, from five pints of oil; and, on increasing it to above 600°, considerably; the gas was not in much quantity; the essential oil was distilled, but very little gas.

Q. It required more than 600° to produce any quantity of gas? A. Yes.

Q. Can you form an opinion, whether this mode of refining sugar, is more or less dangerous than the ordinary mode?

A. In consequence of there being no naked fire under the sugar-pan, and the source of heat being so easily cut off, even if the sugar should boil over, I consider this much safer.

Q. Could any gas be generated by the process, suppose a person negligent enough to leave the fire to its own course?

A. If he had negligently done it, there would not be fuel enough left in it for the purpose.

*Mr. Scarlett.*—There is no evidence of negligence: my learned friends have put cases to their witnesses, a supposition about the man's negligence, or his activity—they do not produce the man, and, therefore, why should they put a supposition.

*Mr. Serjeant Taddy.*—I will alter the question. What degree of fire would it require to produce gas at all from the oil, in such a vessel as that?

A. The degree of heat must be a little below 600° to produce gas. I think it would be difficult to crowd enough fire into that fire-place, to produce gas in any quantity.

Q. If gas had been generated, would it produce any danger to the manufactory?

A. I conceive that that gas would have been discharged by the steam-vent inevitably.

*Lord Chief Justice Dallas.*—Do you know any inflammable gas which is not lighter than common air?

A. I do not recollect any.

*Mr. Serjeant Taddy.*—Have you produced any gas heavier than common air?

A. Yes:—I perhaps may be allowed to state, that I wished to ascertain whether it was possible to melt the pipe by the heat of the oil.

Q. At what heat does sugar emit inflammable gas?

A. I apprehend it was about 330°, but I do not recollect it; an accident happened in the experiment.

Q. Did you make your experiments with old or with new oil?

A. With both.

Q. Will you inform us of the difference you found in your experiments, between new and old oil?

A. There was scarcely any difference at first; but I heated some of the old oil to a boiling point, and I found afterwards that it produced gas at rather a lower temperature.

Q. What was the difference; how much lower was it?

A. With the new oil I observed gas at 585°, old oil 568°.

Q. That is oil that had been boiled?

A. I received it as old oil, and boiled it myself, with a view to determine whether the leaden pipe could be melted. I immersed some lead in oil, and heated it up to 600°, and took out the lead not melted.

Q. It would not have the effect of melting lead?

A. I conceive it impossible.

*Mr. Scarlett.*—Explain what you mean by permanently inflammable gas?

A. That which is not condensable.

*Mr. Serjeant Taddy.*—What would have been the effect, if this gas had been generated on its taking fire?

A. I apprehend the gas, if the fill-house had been perfectly air-tight, would have formed a cloud under the ceiling, and it would have burnt in the way inflammable air burns in coal mines, but here it had more facilities of escape.

Q. If it took fire, what would have been the consequence?

A. I apprehend, not an explosion, but a lambent flame.

Q. And in order to take fire at all, the place must have been air-tight? A. Yes.

*Cross-examined by Mr. SCARLETT.*

Q. What do you mean by permanently inflammable gas?

A. I believe I used the term, but I mean permanently elastic gas.

Q. You annexed no meaning to permanently inflammable gas. I apprehend what was meant by it was, permanently elastic gas?

*Lord Chief Justice Dallas.*—There is gas permanently elastic, and yet not inflammable

A. It may be permanently elastic and either inflammable or not.

*Mr. Scarlett.*—What do you mean by permanently inflammable gas?

A. It was used by one of the gentlemen in Court, not by a chemist.

*Mr. Solicitor General.*—Permanently inflammable gas, when once lighted, burns?

*Mr. Parkes.*—That is what I meant: it is not a scientific term, but I made use of it to inform the Jury.

**RALPH WALKER, Esq.**

(*Engineer of the East India Dock Company, &c.*) Sworn.

*Examined by Mr. STEPHEN.*

Q. You are a civil engineer? A. Yes.

Q. Were you present, after the fire, at the search that was made for the boiler? A. Yes.

Q. What appearances did you observe on the boiler?

A. The appearance, at the beginning of the observations upon it were, that the boiler was covered all but the end next the stoke-hole; it was covered with rubbish coming down from above; and the end next the stoke-hole might be covered from three to four feet high with rubbish, and a greater height when backwards towards the flue.

Q. Did the boiler lie under the rubbish?

A. The boiler was under the rubbish.

Q. What did the rubbish consist of?

A. Broken sugar-pots, mixed with some iron and other things. There is one thing I should state, before I withdraw: the top of the boiler was much compressed; upon the top of the boiler the metal melted was bulged round the man-hole, that shewed me, that after the fire the melted metal had fallen on the boiler; if the boiler had not been compressed, it would have gone off on each side the boiler.

Q. What kind of metal was this?

A. Like bell metal.

Q. The sort of metal which would come from a steam-engine? A. Exactly so.

*Mr. Serjeant Lens.*—All this is in proof.

CHARLES SILVESTER, Esq. Sworn.

*Examined by Mr. SOLICITOR GENERAL.*

Q. I believe you have directed your attention to chemical and philosophical enquiries? A. I have.

Q. Have you looked at this apparatus with a view of giving evidence here to-day?

A. I have seen the model before, and I believe it is in the same state now.

Q. According to the old mode, is the process more dangerous than this new plan?

A. I conceive this plan to be much less dangerous:—the heat is applied in the old way to the pan; in this case the naked fire is not applied to it, but to a substance at 360°; and therefore I do not think the fire can have the same effect upon it.

Q. Have you attended in Court during the examination of Mr. Wilson? A. Yes.

Q. Did you attend to his examination? A. Yes.

Q. Do you agree with him in the evidence he gave, or in what do you differ?

A. I do not know that I differ with him in any thing I am acquainted with equally with himself.

Q. Have you made any experiments with respect to the facility of producing gas from oil or sugar?

A. I attended experiments at Mr. Cooper's laboratory.

Q. What was the result?

A. We made experiments on two species of oil, one which was mentioned by Mr. Wilson, which had been boiled for two years, and the other was new oil; the experiment was commenced at about 200°, and I minuted the time myself; we marked the temperature about every five minutes; now



we observed, during the course of the rising of its temperature, that the increase of heat, in the first intervals, was in a much greater ratio than as we rose higher. I observed that the fire was pretty uniform; indeed we endeavoured to keep it so, and I should imagine equal quantities of heat would be applied to the vessel all the time: the first interval was  $15^{\circ}$  in the five minutes, and this kept gradually decreasing till I believe about the end of the time, which I think was upwards of two hours; it ended in three degrees, and then it arrived at the temperature which inflammable gas began to be given out, which has been mentioned before,  $570^{\circ}$  or  $580^{\circ}$ ; the oil which had been boiled previously, gave out gas a little sooner; when a match was applied to it, it took fire sooner than the oil did.

Q. At how many degrees sooner do you recollect?

A. I think not more than 20 or 30 degrees.

Q. Did you keep the minutes?

A. No, Mr. Donkin wrote them down;—I watched the time and did not take any minutes.

Q. Did you perceive any material difference between the old and new oil?

A. Very little with respect to the inflammability; I think the new oil supported the combustion ultimately better than the old oil, when we first applied the match to it; the moment you removed it, or in a very short time afterwards, the flame gradually extinguished, and as it arose in temperature, the flame became more permanent; but I think the new oil was more permanent than the old.

Q. Would it be easy to produce that temperature in that apparatus with that furnace?

A. I cannot say what it might at last do, supposing the pump stopped; but if it did produce the effect, it would take a very long time: I could say, from the nature of the experiments we made, and the diminution in the accession of heat, that this must have taken three hours to raise it from  $360^{\circ}$  to  $600^{\circ}$ , attending constantly to the fire.

Q. If gas was produced, what would be the effect?

A. There is no doubt, having a chimney, it would be impossible any gas should accumulate in the building; because, from the communication of the heat of the boiler and the sugar, the air would be rarified over it, and must necessarily ascend; and if there were doors open for a lateral current to come in, there must have been a current in the chimney, which might carry off any vapour that might escape.

Q. If gas were given out from that apparatus, would it be in considerable, or in small quantities?

A. In very small quantities at first.

Q. So that it would escape?

A. Yes, the oil would be decomposed so gradually as to let the gas escape without compression; and after the gas escaped to the end of the tube, it would require to be lighted.

Q. Would it be possible to set fire to the oil in the vessel?

A. It would not, because there could be no oxygen present.

*A Juryman.*—There must be a light applied to it externally.

*Lord Chief Justice Dallas.*—Fire and flame are essentially different.

*Mr. Solicitor General.*—Is it possible that by any leaking of the oil into the fire, that flame could communicate to the oil in the vessel?

A. By no means.

JOHN THOMAS COOPER, Esq.

(*Lecturer on Chemistry at the Russel Institution,*) Sworn.

*Examined by Mr. SERJEANT LENS.*

Q. You are the gentleman referred to by the last witness?

A. Yes.

Q. You are acquainted with that machinery, and the work carried on there?

A. Perfectly.

Q. Were you acquainted with the old mode of boiling sugar?

A. Not in a large way.

Q. Have you looked at that apparatus and the mode in which it is constructed, to ascertain how things are conducted in it?

A. Yes, I am perfectly well acquainted with it.

Q. Have you made any experiments as to the degree of temperature at which inflammable gas is produced in oil?

A. I have.

Q. What have you found in general to be the temperature at which it is produced in old oil?

A. The lowest temperature was between 570° and 580°.

Q. At that height does it produce gas in abundance?

A. That is the first appearance of the gas, and in extremely small quantities.

Q. To have it in large quantities, must you ascend higher?

A. Yes.

Q. Would it then be permanently inflammable?

A. I never found that under 610°.

Q. Some that is produced, will, by the application of a flame, catch fire, and when the flame is withdrawn it will go out?

A. That is oil vapour.

Q. But when it burns by itself, you consider it permanent?

A. Yes.

Q. If gas should be produced in that model, or in a work that corresponds with that model, constructed as it is, what

effect would it produce upon the parts of the building to which it had access?

A. I should conceive it would all go away through every aperture, the greatest part would pass up the vent.

Q. Unless it was stopped at the top? A. Yes.

Q. While it remained open it would not accumulate under the roofs, but would ascend up that vent? A. Yes.

Q. Is that the natural effect which would be produced?

A. Yes.

Q. It would go out where that steam-vent communicates with the air? A. Yes.

Q. In your judgment, would that be sufficient to carry off any considerable quantity of gas?

A. I should consider, if it was generated at the rate of 500 cubic feet a minute, it would go off.

Q. With that apparatus, which you had, and the means of producing that gas, could it be produced at that rate at all?

A. I should consider it totally impossible.

Q. Unless something interrupted the steam-vent from having its natural operation, that would be the effect produced? A. Certainly.

Q. In general, in your judgment, is this mode of producing heat, to boil sugar, more or less dangerous than the other?

A. I should consider it in every respect, less dangerous than the old mode of boiling by the open fire.

Q. There is a difference between the old and new oil, you have mentioned what the old oil produces?

A. There is about ten or fifteen degrees difference in the heat at which they produce gas.

Q. Have you ever made experiments enough to be able to speak to the difference between them, on the average?

A. Yes.

Q. As you go on wanting to increase heat, do the increments of heat go on more slowly?

A. It is in a much less ratio, as the heat increases.

*Mr. Solicitor General.*—So that, after you get to a certain temperature, it is difficult to add to it? A. Yes.

*Mr. Serjeant Lens.*—Perhaps you can give the proportion?

A. I cannot state it exactly; it took to raise the oil, in one experiment, forty minutes, from 200° to 350°, and from 350° up to 600° or 610°, it took, I believe, very nearly two hours and a half more.

Q. So that, to raise it less than the half of the whole, took two hours and more; whereas, the first had been produced in forty minutes? A. Yes.

Q. So that it is considerably slower? A. Yes.

*Lord Chief Justice Dallas.*—In proportion as it derived heat, the time was longer to increase it? A. Yes.

Q. These are your experiments, I believe? [*handing up a paper to the witness*].

A. This is not my hand-writing, I do not know by whom they were taken, I cannot speak to it.

Q. The experiments enable you to speak to the ratio?

A. Yes, I can within a trifle.

Q. As to the numerical difference, you cannot speak to it?

A. Yes, I can recollect that we took our temperature every five minutes during the time, and we could hardly elevate it at all in the last five minutes, and the fire was regularly supplied the whole time.

Q. So that it was nearly become stationary? A. Yes.

*Cross-examined by Mr. SCARLETT.*

Q. At what temperature was it at that time?

A. From 600° to 610°.

Q. That is the temperature at about which oil boils?

A. No: at a much higher temperature than that.

Q. When did you first make experiments upon the comparative difference between the time of heating old and new oil?

A. I should think it must have been about a month, or five or six weeks ago.

Q. Did you make these experiments in the presence of the gentlemen examined to day?

A. I believe there were thirteen or fourteen gentlemen. I have made many other experiments, which have produced similar results, before and since.

Q. You first began about five weeks ago? A. Yes.

Q. You do not agree with Mr. Accum, that oil that has been boiled, and is old, will give out an inflammable gas at 460°?

A. It did not do so with me.

Q. Or that the oftener it has been heated and the longer, the quicker it becomes heated again?

A. That I am not aware of, I made experiments with the same portion of oil three times over, in which the results were as nearly as possible alike.

Q. You tried it with the same oil three different days?

A. Yes.

Q. Did you find it heated quicker?

A. I could find no difference in the ratio of increase, there might be a little difference, but that might be owing to a difference in the fire; we had all the circumstances the same, as near as possibly could be.

Q. How long had you heated it each time, on the two previous days?

A. About four hours each time, it took that to get it up to the temperature at which it began to decompose.

Q. You say you saw the sugar-house before it was burnt?

A. No, I have seen this apparatus at work in another place.

Q. You never were at the sugar-house, then? A. No.

*Robert Hendrie, Esq. called.*

*Mr. Scarlett.*—If it is to prove he was present at Cooper's experiments, it is not necessary?

*Mr. Serjeant Vaughan.*—No, it is not.

ROBERT HENDRIE, Esq. Sworn.

*Examined by Mr. SERJEANT VAUGHAN.*

Q. I believe you have applied your mind to chemical pursuits? A. Yes.

Q. You were present when the examination took place after the fire happened? A. Yes.

Q. You have heard Mr. Wilson's evidence? A. Yes.

Q. Have you been in the habit of making experiments to ascertain the temperature at which gas would be emitted from oil?

A. I have made no experiments myself, but I was present at that of Mr. Cooper's.

Q. You have heard Mr. Cooper's account of it?

A. Yes.

Q. Do you agree with him?

A. I made an experiment afterwards, to ascertain the difficulty of raising the oil above a certain degree, with a particular portion of fuel. I took a small portion of oil and heated it in a vessel over an Argand lamp, I found I could easily raise it to 400°, but I could not get any further with the same degree of heat.

Q. You do not speak particularly to what point the vapours would be emitted at? A. No.

Q. You agree with Mr. Cooper in his evidence?

A. Yes.

Q. I believe you have examined that model with some care? A. I have.

Q. And you have heard what the old process of boiling sugar was?

A. I am not well acquainted with sugar, but I have enquired into it considerably lately.

Q. What is your opinion as to the comparative safety?

A. I consider this infinitely safer.

Q. Do you agree in the reasons the witnesses have given for that safety? A. I do.

**HENRY COXWELL, Esq. Sworn.**

*Examined by Mr. SERJEANT TADDY.*

Q. Are you Chairman of the Committee of Chemistry in the Society of Arts? A. I am one of them.

Q. Have you made any experiments upon the properties of oil and sugar, and their relative combustibility?

A. I was present at some experiments that were made for the purpose of ascertaining the degree of temperature at which oil gave out inflammable gas at Mr. Cooper's.

Q. Do you agree in the evidence that he has given?

A. Altogether.

Q. Have you examined this model? A. I have.

Q. Judging from your experiments, and from the mode of conducting the operation as exhibited there, do you consider it more or less hazardous than the common mode?

A. I consider it infinitely less so.

Q. On what account do you consider it less hazardous?

A. I must subscribe to the reasons already given by Mr. William Allen and others.

*Cross-examined by Mr. SCARLETT.*

Q. Assuming there is no danger in boiling the oil, the application of the heat, by means of oil, to the sugar, is less dangerous than the ordinary mode? A. Yes.

*Re-examined by Mr. SERJEANT TADDY.*

Q. Do you consider there is any danger in heating the oil?

A. I do not understand the question.

Q. Do you think there is any danger in heating the oil?

A. No.

Q. Therefore you consider it less hazardous? A. Yes.

*Mr. Scarlett.*—I only put the question to shorten the point between us.

*Mr. Solicitor General.*—The question is, whether the whole thing together is more or less hazardous.

*Mr. Serjeant Taddy.*—Taking the whole process together, is it more or less hazardous than the ordinary operation?

A. Less hazardous.

*Lord Chief Justice Dallas.*—All circumstances considered, your opinion is, it is less hazardous? A. Yes.

**THOMAS GILL, Esq. Sworn.**

*Examined by Mr. STEPHEN.*

Q. Are you Chairman of the Committee of Mechanism in the Society of Arts?

A. One of the two Chairmen of the Committee of Mechanics.

Q. Are you at all acquainted with the relative combustibility of oil and sugar?

A. I witnessed the experiment at Mr. Cooper's.

*Lord Chief Justice Dallas.*—Do you agree with the account given of that? A. Entirely.

Q. Have you examined that model? A. I have.

*Foreman of the Jury.*—We wish to shorten the examination as much as possible, my Lord.

*Lord Chief Justice Dallas.*—There will be a break soon in it, and we will then adjourn; and they will go on to-morrow morning for the defendant, and therefore that could not assist all.

*Foreman of the Jury.*—We thought there was an accumulation of evidence upon one point?

*Lord Chief Justice Dallas.*—Therefore, I asked whether he agreed.

*Mr. Stephen.*—What is your opinion of the comparative safety? A. I cannot conceive any comparison.

*Lord Chief Justice Dallas.*—After having had Mr. Parkes, Mr. Accum, Mr. Brand, Mr. Allen—all names that are respectable, and more than respectable, high in chemical and mechanical knowledge, persons who cannot be expected to know so much, cannot add weight.

*Mr. Scarlett.*—Unless I shew experiments different in the result altogether, I can have no case upon that part of the case, therefore to repeat that Cooper's experiments were so and so, is nothing.

*Mr. Stephen.*—Do you know of any other experiments than those you saw at Mr. Cooper's. A. No, I do not.

Mr. JAMES DEVILLE, Sworn.

*Examined by Mr. SOLICITOR GENERAL.*

Q. Have you been much accustomed to the uses of oil and experiments connected with it? A. Yes.

Q. Have you seen it on a very large scale? Are you at all acquainted with this apparatus?

A. Not beyond what I have gone into since this action has been pending—not previous to that.

Q. What is your opinion as to the comparative danger of the old and new method?

A. I have been in sugar-houses in great number, and from hearing the descriptions and seeing this, my opinion is, that it is much safer than the old mode, for the reasons stated.

Q. Taking into consideration all the circumstances?

A. Yes, from two experiments I made to try when oil emitted inflammable gas.

Q. What were those experiments?

A. I took the ratio of the degrees as I went on, every two minutes and a half.

*Lord Chief Justice Dallas.*—Are these Mr. Cooper's experiments?

A. No, my own. I found, in the first experiment, it gave an inflammable vapour at  $586^{\circ}$ .

*Mr. Solicitor General.*—Was that new or old oil!

A. It was new oil: I used no old oil at all; it was permanent at that; it gave a vapour before that, but it was not permanent at less than  $586^{\circ}$ . In the second experiment it was not permanent at  $595^{\circ}$ .

Q. Was it the same oil?

A. No, it was not, it was fresh oil.

Q. But still it was new oil? A. Yes.

Q. Is there considerable difficulty in getting the oil up to that temperature?

A. Very difficult; and the ratio of the degrees shews it: I went from 27 to 18—15—12—10—8— $6^{\circ}$  of heat acquired in the same time.

Q. With the same degree of fire?

A. The fire was stronger. In the first experiment I could not get beyond  $586^{\circ}$ .

Q. Do you conceive in that furnace it could be done without great time and attention?

A. I do not think it would be possible to convert the whole oil into gas fit for illumination, with the fire described to have been under it. I consider that the brick-work must be taken from the sides, giving the fire room to play round it.

Q. Having such a furnace as that, such an effect could not be produced? A. I think not.

Q. If gas was produced, would it be in small quantities?

A. I think so.

Q. Would there be any apprehension of its remaining?

A. It appeared to me impossible to remain there.

Q. If it did remain in the apartment and mix with the atmosphere, and then took fire, what would be the effect of the explosion?

A. It would rend and tear the whole place to pieces.

Q. You would hear it a little further than the next street?

A. No doubt of it.

Q. Gas of that kind will not take fire without flame?

A. No.

Q. If such gas does escape and mixes with the atmospheric air, and being then confined, fire is applied to it, the combustion will be terrible?

A. It would be, as Mr. Accum stated, dreadful to the surrounding neighbourhood.



**Q.** In your judgment, could it remain up at the top burning away there with a lambent flame?

**A.** No: the flame I produced in both experiments was extremely weak, I could not light a dried match at it at all. I tried it in both experiments, though in the second experiment the thermometer was 660°.

**Q.** In that kind of building, where there is some kind of communication with the external air, if the gas ascends, can it remain by itself without mixing with the atmospheric air?

**A.** I should think not.

**Q.** It may be possible, in a very close vessel, where there is no motion of any kind, that the gas may remain unmixed; but where there are draughts, is it possible that it can remain unmixed?

**A.** I should think not in any quantity.

*A Juryman.*—Mr. Deville is not a chemist? **A.** No.

*Cross-examined by Mr. SCARLETT.*

**Q.** What are you? **A.** A general manufacturer.

*Mr. Solicitor General.*—You are a gas-light manufacturer?

**A.** Yes.

*Mr. Solicitor General.*—Will your Lordship allow me to ask Mr. Deville another question?

*Lord Chief Justice Dallas.*—By all means.

*Mr. Solicitor General.*—Have you seen oil boiling in large quantities?

**A.** Yes, at Hull.

**Q.** Will it take fire by the application of a light?

**A.** No; I saw a lighted paper put to it, and it would not take fire:—there were at least five or six tons.

**Q.** In a large pan? **A.** Yes.

**Q.** In a boiling state? **A.** Yes.

**Q.** Was that done for the purpose of shewing the experiment?

**A.** Yes, to myself and several people present.

**Q.** Is it possible the oil could have taken fire in that retort?

**A.** I should think not.

*Mr. Serjeant Vaughan.*—What was the degree at which it boiled?

**A.** I thought the oil boiled, in my second experiment, at between 660° and 700°.

*Lord Chief Justice Dallas.*—Pray, Mr. Parkes, what is the heat of the flame of a lighted candle?

**A.** I cannot inform your Lordship, I never tried it, but it cannot be less, I think, than 900°.

**Q.** In the table in your book it is mentioned, I believe?

**A.** I have forgotten it, if it is; but I know it is mentioned by some chemical author.

*Mr. James Deville, Cross-examined by Mr. SCARLETT.*

Q. This six ton you saw was boiling blubber?

A. It was taken from the blubber—it was boiling for the purpose of making it, in Exton's manufactory.

Q. At a place where they extract oil from blubber?

A. Yes.

*Mr. Scarlett.*—I wish to call up the second witness.

*Mr. Solicitor General, (to Mr. Parkes.)*—Suppose gas was elicited from the oil, and taking the construction of the house altogether, and that were to get into the room, would it mix with the atmospheric air? A. Most assuredly.

Q. So that, if it took fire, it would explode?

A. It would depend upon the proportion.

Q. If it mixes with the atmospheric air, can it take fire without explosion?

A. No; but Mr. Dalton of Manchester has set that question at rest; he has proved, by direct experiments, that two gases cannot remain together for any length of time without mixing. He has taken a phial of carbonic acid gas, and another of hydrogen gas; he inverted the hydrogen, which is the lightest, over the carbonic acid gas, and they became entirely mixed, that is, the lighter gas descended, and the heavier arose into the upper phial, and they became one uniform mixture. Hence he concluded, that every kind of gas is as a vacuum to another gas.

Q. Then if any gas escaped, it would mix with the atmospheric air?

A. It would go up the tube; it would mix with the atmospheric air in its passage up the steam-vent.

Q. Supposing it got into the room?

A. It would then mix with it, and if time was allowed, it would be mixed intimately.

*Lord Chief Justice Dallas.*—Would they mix mechanically or chemically?

A. It has been determined that atmospheric air, although a compound, is not a chemical compound, but a mechanical one.

Q. If it is in the room and takes fire, must it explode?

A. If mixed in a proportion to produce an explosive mixture; but if it is emitted from a small tube, then it may burn without an explosion, not having a due mixture of atmospheric air.

Q. When it comes in a volume into the room, can it take fire without exploding? A. Certainly not.

*Mr. Scarlett.*—No doubt you have often heard of instances

in which the gas from coal mines, where persons have descended with a light, the gas exploded? A. Yes.

Q. It occurs in the descent?

A. No, that I do not know:—I do not recollect having heard of such a thing. Those I have heard of are of men at work with a lanthorn, and when they have broken into a fresh cavern, there has been an explosion.

Q. But you have never heard of a person going down with a lanthorn, being blown up before he got to the bottom?

A. I never heard or read of such a thing.

*Lord Chief Justice Dallas.*—What sort of a lanthorn, because it will not explode unless it comes in contact?

*Mr. Scarlett.*—It frequently happens in a cavern in which the gas is collected; that it does not rise to the top of the shaft, but hangs together.

*Mr. Solicitor General.*—Will your Lordship ask Mr. Barry, whether, in a room like that, it would not have exploded?

*Lord Chief Justice Dallas.*—Ask him.

*Mr. Solicitor General.*—Mr. Barry, suppose gas had escaped, and got into the room, could it take fire without exploding?

A. I consider the case to be an impossible one. If any gas were found on the top of the ceiling unmixed with common air, I do not think it would produce explosion: it is another thing, whether it could be there without being mixed, and I do not think it possible that it could have been there under such circumstances, for it must have escaped up the steam-vent, which had an area of four square feet.

**TIMOTHY BRAMAH, Esq.**

(Civil Engineer, &c. &c). Sworn.

*Examined by Mr. SERJEANT VAUGHAN.*

Q. You have made some experiments upon this subject?

A. Yes, I have.

Q. I believe you have examined that model, and have attended to the construction of it?

A. Yes, I saw the original model.

Q. And you heard the witnesses examined to-day?

A. Yes.

Q. Did you make any experiment with respect to the gas obtained from oil under a certain temperature? A. Yes.

Q. State the result?

A. I cannot state minutely, but I agree with the gentlemen examined before; I attended the experiments of Mr. Cooper, and also made some at home.

Q. And you agree in the results Mr. Cooper has spoken of?

A. Yes, I do.

Q. As to the point at which the gas would be emitted permanently elastic?

*Lord Chief Justice Dallas.*—He agrees with him.

*Mr. Serjeant Vaughan.*—You not only witnessed Mr. Cooper's experiments, but made experiments yourself, and the result of your experiments agrees with his?

A. Yes, as far as they were carried: I tried the same experiments as have been mentioned by Mr. Hendrie, of heating oil in a vessel over an Argand lamp, and I gave it up, because I could not get the oil up to the desired heat; for having got it to a certain degree, the thermometer was perfectly stationary. I tried the experiments again in another way, and the plate underneath the apparatus melted, and I gave it up.

Q. Is there any other observation you wish to make?

A. No, I agree with the other gentlemen, in the extreme and progressive difficulty of getting it to a high temperature in a short time.

Q. You have seen the thing itself?

A. Yes, I have—I have seen the premises, and seen this in operation on a large scale, at Mr. Wilson's, some years ago—a year and half ago.

Q. Is it more or less safe than the old plan?

A. I think, for the reasons already adduced, it is much less dangerous than the former plan.

*Mr. Scarlett, (to Harry May).*—You told us, when you were on the step, you asked Muller if he was ready for the engine?

A. Yes.

Q. Was the gas-light lighted then?

A. I cannot say.

Q. Did you see Muller there? A. No.

Q. You heard him? A. Yes.

Q. You cannot say whether the gas-light was lighted, or not? A. No.

Q. Have you worked long with your masters?

A. Twenty-four, or twenty-five years.

Q. How long has Muller worked for them?

A. A year and a half, or a year—I cannot say exactly how long.

Q. Was there any other man in the fill-room besides Muller?

*Mr. Serjeant Vaughan.*—He has not said he was in the fill-room.

*Mr. Scarlett.*—Yes, he has—when you stood upon the steps of the long-house to ask Muller whether he was ready for the engine, he was in the fill-room? A. Yes.

Q. And you heard him say, he was not ready yet; but he would be in a few minutes?

A. Yes, and I came back in ten minutes.

Q. Was there any other person who belonged to the fill-room besides Muller?

A. I cannot say, for I did not go down below?

*Mr. Solicitor General.*—This witness has been cross-examined, and re-examined; this is a new cross-examination.

*Mr. Scarlett.*—The first question was, whether he saw the gas-light lighted; the second question, whether another person worked habitually in that room?

A. I never was in the room that morning.

Q. Who was the man who attended the sugar-pan?

A. I forget his name, he minded the fire.

Q. Muller attended to both? A. Yes.

*Mr. Solicitor General.*—After you put the engine on, how far did you go?

A. Only to the engine-house door.

Q. Did you hear any explosion of any kind?

A. No, not at all; no such thing, nor any thing like it.

Mr. GEORGE WICKÉ, called again.

*Examined by Mr. SOLICITOR GENERAL.*

*Mr. Scarlett.*—I think I ought to object to this: is this a question you have omitted?

*Mr. Solicitor General.*—Yes.

*Mr. Scarlett.*—Then, let my Lord put it?

*Mr. Solicitor General.*—Will your Lordship allow me to ask whether he heard any explosion?

*Lord Chief Justice Dallas.*—It is not necessary to ask that. It is quite out of the question.

*Mr. Solicitor General.*—Then I will not ask it.

*Mr. Scarlett.*—Mr. Wické has stated an important fact, which I will remind the Jury of to-morrow; but I shall not mention at present what it is.

The Court then Adjourned at six o'Clock, P. M.  
till to-morrow at ten o'Clock.

## SECOND DAY.

MR. SCARLETT,

May it please your Lordship—Gentlemen of the Jury.

I assure you, that it is with unfeigned reluctance that I feel obliged to occupy some portion of your time, after the great attention you have already bestowed on this cause yesterday—however, it is not my inclination to occupy more of your time than I can avoid, not only from the regard which I have for your own convenience, and that of his Lordship, but because I labour under indisposition, arising from recent and long-continued fatigue and exertion, that renders my address to you, a matter of great pain. I trust, therefore, you will make some allowance to me, and endeavour to supply, by your attention, that which I may be deficient in, in statement or perspicuity.

Gentlemen, this is a very important cause, but it is the more important, because it is one of those causes which it is extremely difficult for those who have to decide on, to consider altogether free from that natural wish, which every body, whose mind is properly constituted, must form in favour of a suffering party. I agree with the learned Solicitor General, in stating, that the plaintiffs are persons of great respectability, to whom I shall certainly attach nothing like blame or fraud; it is therefore quite natural to wish them success in a case where they are individual sufferers, and the other parties are more numerous, and spread over a wider surface. Questions of this sort are always of importance, because, wherever they are decided upon the principles of law and justice, and in opposition to that secret wish, which every well-formed mind entertains, they exhibit the triumph of justice over favour and partiality.

The defendants are persons of the greatest respectability—there are no merchants who can boast of greater integrity, or a higher name, than the directors of this institution—they can have no personal wish; if they had, it would rather accord with the wish of other persons; they have a painful duty to discharge, but it is a duty which they are bound by every tie of conscience and honour, rigorously to discharge; it would be perfectly futile to have any rules or regulations for effecting insurances against fire, if, when cases occurred that brought into consideration the violation of those rules, you were to regard them as matter of form, and oppose that which is not substantial, to the claims of justice. In every contract of insurance, as well against fire, as against sea-risk,

the parties ought to stand on equal terms; and if rules are laid down, whether rules that result from the invariable maxims of justice, and therefore are implied, or rules laid down arbitrarily, they ought to be rigorously adhered to.

Gentlemen, I shall follow the example of my learned friend, who opened this case, by endeavouring to disembarass from your attention all technical matters, and you will find the questions resolve themselves substantially into three; and in whatever forms they may be spread over this record, you will find the determination of these three questions, or any one of them, in favour of the defendants, will bring you to a conclusion of this cause. The first question my learned friend has hardly touched on at all, and that is as to the description of the premises. One question made upon this record, is, whether the premises insured are properly described?—I affirm that they are not: if you should come to that opinion, the defendants will be entitled to your verdict. Another question is, whether the fire was occasioned by this manufactory, or this process of boiling sugar by means of heated oil? that is the second question, upon which you have heard much evidence on the other side; and the third question is, from whatever cause it resulted, is this process of applying the heat by means of a cauldron of heated oil, an increase of risk? that is the third question, which, though it may be illustrated by the second question, yet is not necessarily connected with it; because, if a fire had happened from lightning, or any other cause, yet, if the whole risk of insurance is increased contrary to the opinion of some of the witnesses examined yesterday, the defendants will be entitled to your verdict.

Now, upon the first question, I presume, in this place, and to this audience, I need not state the practise of these offices, that *the description* of a building always includes the communications it has with other buildings. It is a well-known fact, that a dwelling house which communicates with a manufactory where there is a fire used, if it is not separated, but opens to it by a door, is considered as liable to pay the same premium as the manufactory; if it is separated by an iron door, it pays, in most of the offices, only half the premium; if separated entirely, it pays only the ordinary premium. My learned friend referred to the building act; by the building act, (not that I mean to say, the opinion of the legislature on a matter of fact is binding,) it is contrary to law, that there should be any communication between distinct dwelling houses, through the party wall of houses occupied by different persons. With respect to warehouses, communication is allowed by means of iron doors: not that the legislature supposed they were as safe from all risk of fire, as an impervious

brick wall, through which the fire will not pass, but that it was a better communication than a wooden door. If a fire takes place, and is continued for any considerable time, in a room fenced off by an iron door, the moment that door gets red hot, it serves as a rapid mode of communicating fire to an adjoining apartment: we say, on every policy, it is the duty of the party proposing it, to state to the office, and, in fact, to have it stated in the policy, in what respect the building communicates with other buildings.

Gentlemen, you will bear in your recollection, that Messrs. Severn and Company, comprise within their premises, three distinct places, in which they carry on the process of manufacturing sugar; one is called the long-house, the other the grinding-house, and the other the new-house. The insurance in question is upon the grinding-house; and although the particular injury complained of did not originate in the grinding-house, but was communicated to it from the long-house, yet one question raised on this record, and which appears to me to be decided by the evidence for the plaintiffs, is, whether the whole of these did not constitute one set of premises, and whether the injurious process was not carried on in them generally, considering the communications made by the iron doors from one house to another, as, in fact, constituting nothing more than apartments of one common building; for they are enclosed by one common wall, they are the premises of one person carrying on one trade; they were all supplied by one fire engine; the operations of which were carried into each of the buildings,—employed to work the pump in this place, to work the cranes and carry on every species of machinery in the others, and to turn the mills in the grinding-house insured; all, therefore, conducted under one direction, and, in fact, one trade carried on, and combining together these different apartments, communicating with each other by iron doors. But supposing a doubt could rest upon that subject, the record is so shaped as to meet the question; because it is stated in one place that the building insured communicated with other buildings, by means not disclosed on the policy, or to the body insuring, and therefore it is improperly described. Now if this grinding-house had communicated with the long-house only by iron doors, although, in point of fact, that communication was not stated to the Society when the insurance was effected, and does not appear on the policy, they would yet have not made that objection; and I will tell you why;—because they had insured the long-house by a separate policy, previous to insuring the grinding-house; and in that policy communication had been



made, that the long-house communicated with the grinding-house by iron doors; and therefore, in point of fact, they had the knowledge by a previous communication, in effecting the previous policy, that these iron doors existed between the two; and although, in point of strict law, they might say, in each insurance, you ought to make a communication, because you cannot suppose the Directors to carry about a history of every policy effected, any more than an Underwriter: and it would be strange to affect the Directors by a policy Z, because, two years ago, you effected a policy A, with them; but having had this information for another purpose, we would not now insist upon this objection. But although there was a previous policy, in which the long-house was described as communicating with the grinding-house with iron doors, yet no policy described the new house as communicating with one or the other. I believe the new house was an apartment added after the effecting of the policy on the long-house, and then they ought to have made a communication with respect to their former policies; but this policy on the grinding-house was effected in October last;—it is a mere renewal of a former policy effected on the grinding-house for a less sum, and it is effected in the same terms, and containing no other description than this, “the building of their grinding-house, and “stoves, situate as aforesaid;”—that is, situate in Church-lane, Whitechapel.

*Foreman of the Jury (Mr. Mavor).—*What is the date?

*Mr. Scarlett.*—The 21st of October; and it appears upon this policy, that this was effected upon the cancellation of a former policy for 8,200*l.* (this being for 8,900*l.*) and the description is taken from the former policy, without any communication of any alteration in the premises since the former policy was effected: there is no representation that this building communicates with the long-house, but which, for the reason I have before stated, I should decline objecting to; but there is no communication that it communicates with the new house by iron doors; it communicates in every story by iron doors, not exactly double doors, but folding doors, one above another;—and, in point of fact, the combustion in this very case has arisen from that communication; because you have no reason to conclude, if there had been a party wall without communication, that the fire in this long-house would have been carried to the new house or the grinding-house; and we say, therefore, that the want of a proper description, in a material circumstance, when this policy was effected, renders the policy void;—and we say so, not only upon the general principles of law, which require a statement

to be made of every particular which may by possibility be material, but we say, on the very conditions of the policy, that that statement is requisite.

The conditions have been referred to by my learned friend very lightly, either because he did not like to touch on them in the opening, thinking it safer, perhaps, to leave them for the reply, or that he did not think it fit to touch on them at all, thinking it might be glossed over without the due remarks that were called for. There is one little clause in this policy, which will shew the justness of my remarks; after enumerating the common, hazardous, and doubly hazardous insurances, there comes this clause, "also buildings and stock of sugar refiners, sugar grinders, sea biscuit bakers, tallow melters, chymist's laboratories," and so on, may be insured by special agreement.

**LORD CHIEF JUSTICE DALLAS.**—What condition is that?

**MR. SCARLETT.**—It is not among the conditions, but it is at the bottom of the statements of what are deemed common, and what hazardous insurances, under the head of annual premiums to be paid for insurance; then there is No. 1, No. 2, No. 3:—Observe, Gentlemen, this also, after specifying, for the information of the public, what are common insurances at 2s. per cent., what hazardous at 3s., and what doubly hazardous at 5s.; they then wish to shew that particular trades, conducted in a manner that may be attended with more or less risk, according to the special circumstances of the trade, or the nature of the buildings where it is carried on, or the particular process employed by the manufacturer, are not to fall within the general rules of either common, hazardous, or doubly hazardous, but are to be the subject of a distinct specification, to be made the ground of a special contract; and therefore it is said, that all these particularly hazardous trades are to form the subject of special agreement: now as the object of this communication is to inform those who wish to effect insurances, that property embarked in such trades is not to fall within the general rules, it follows of course, that to enable both parties to come to a fair understanding upon the terms of the agreement, there ought to be an exact and particular communication of all matters respecting the buildings in which these trades are carried on; because, I will put it to you, whether, if an insurance on a sugar-house was to be effected by this Society, on no other communication than that it was simply a sugar-house, when it turned out to be a large building, carrying on different manufactories, subject to the greatest risk, that would be a sufficient description;—suppose it was a turpentine manufac-

tory. I put a strong case to illustrate it; and it is nothing to tell me, if I had known it I should not have made any difference: I cannot tell that I have desired you to state the particulars, and you are to leave me to judge of that. This condition, therefore, implies, that a communication should be made of all matters that regard the description of the building, that may in a greater or less degree affect the risk of the insurance. Now as it is perfectly plain to common understanding, that in proportion as you multiply stoves to a given extent, you multiply the risks of fire; it is clear, if you come to ask me to insure your grinding-house, it becomes material to know whether it communicates, by any aperture whatsoever, with another apartment in which stoves are used and heat applied. Now, the building in question communicated with no less than two,—the new-house and the long-house, and the long-house communicated with the new-house by iron doors in every story: it is a clear and manifest distinction in the risk, and whether they would say, I will take the policy at no additional premium, is a matter you have nothing to do with: the question is, whether it is not a circumstance that ought to have been made known to the persons effecting the insurance.

But, Gentlemen, among the general conditions you find the first condition is this: "persons desirous of making insurance on buildings, are to deliver the following particulars, viz. a description of the buildings"—that is the first particular; the second is, "where situate;" the third is, "by whom occupied;" the fourth is, "of what materials the walls and roof of each building intended to be insured were composed; whether the same were occupied as dwelling-houses, or as warehouses, manufactories, workshops, or how otherwise." Now, I do not go to the next condition—not that I should be apprehensive that my learned friend's argument on that point is correct, but I do not think it necessary to support my position. I say that we expressly required them to give a description of the building: and if they say it is a warehouse and no more, I ask, is that a just description? Does it not mean that you should describe those particulars in which the risk may be more or less increased? I apprehend quite clearly so; and therefore the communication between these buildings seems to me an essential part of the description as it exists in point of fact. If you should be of that opinion, about which, it seems to me, no lawyer can entertain a doubt; unless you are satisfied that an iron door between the buildings is no more an increase of risk than if it was a solid and impervious brick wall (which, I think, no man of

common sense will say), then this is a description that ought to have been incorporated in that policy, and with this observation I discharge that part of the case.

*Foreman of the Jury.*—We should wish to have the plan before us.

*A Jurymen.*—Was there any plan given to the office?

*Mr. Scarlett.*—No, Sir.

**LORD CHIEF JUSTICE DALLAS.**—They generally send their Surveyor to look at the premises.

*Mr. Scarlett.*—That is an extraordinary statement. I beg to deny that. Gentlemen, I will tell you what they would do. If a minute description had been given to them of these premises, and the mode of communication, I think it probable they might have sent some person before they undertook the risk; but it is not true, that they in general send a person, because, if a description comes in the ordinary mode, the offices take sugar-refiners at a given premium. The Imperial Insurance Office, if not instructed by a communication made to them of something extraordinary, take it at the premium they have agreed shall be paid for that risk; but if they generally sent their Surveyor to look at it, why did not my learned friend call a Surveyor, or some of his people, to prove that. I deny the fact—it is a fact that ought to be proved; and you are not to try a cause on the assumption of a fact or conjecture. Gentlemen, I understand the practise to be this: if any thing is communicated to the office of a nature that is novel, or that is of a nature that is not in the usual course of their insurances, and upon which they require information, and which they do not like to take from the party, then they send a Surveyor to investigate the fact stated; but it is not true that they would send a Surveyor if you or I were to come, as a sugar-refiner in Whitechapel, and simply to state we had a sugar-house to insure, and proposed to insure it; professing it was a grinding-house—for a part of the description is the building of their grinding-house and stoves, situated as afore-said. Now, when the former policy on the grinding-house was effected, there was no new house—the new house had been built afterwards; and then, after the new house was built with this communication, they ask for a cancellation of the old policy, and effect a larger insurance by 700*l.* without one word of communication. With respect to the new buildings, the words are, “on the building of their grinding-house and stoves;” “on the engine-house, engine, and utensils therein;” “mill work in the grinding-house;” “stock and utensils in the sugar-house, communicating by iron doors,” (with the grinding-house) for the policy is on the grinding-

house and the sugar warehouse, which have this communication by iron doors. The Company are called on to insure this building in the centre, the grinding-house, and the stock in trade of the warehouse, communicating with it by iron doors, when, at the same time, it communicates with the long-house and the new house (which communicate also with each other), and these different communications are wholly omitted, and were unknown to the body effecting this insurance; and, therefore, it must not be taken here for granted, that their practise is to send their Surveyor whenever a policy is offered; the Surveyors would have too much to do, and have too good a place of it. If that was done, it would render these conditions wholly futile and nugatory. Why do they hold forth to the public conditions, unless it is to prevent their own personal inspection in each case? It would be in vain to propose these conditions, if this answer were to be made in every case. Consider what a state the offices would be in, if that observation were to govern a case of this sort; there is not any case in which the want of a description would furnish a defence, because the answer would be, why not —

**LORD CHIEF JUSTICE DALLAS.**—I only wanted to know the practise, it would not touch the question; because if a party undertakes to give an accurate description of the buildings, he takes that on himself, and that supersedes the necessity of sending any person; he is bound by the description, therefore the question is, whether it was an accurate description or not.

*Mr. Scarlett.*—I believe the practise to be, that a Surveyor is sent to inspect the premises, in cases where the thing is perfectly novel; and I will state this to you freely, if they had been told, we want you to effect an insurance on a sugar-house, in which the heat is applied under a new patent, by means of oil, in a way which has not been used before, I think it is probable they would have sent a Surveyor to examine it, and have consulted chemists upon the risk.

**LORD CHIEF JUSTICE DALLAS.**—Though it might not touch the legal question, it would have affected my mind materially if they had sent a Surveyor.

*Mr. Scarlett.*—The gentlemen who instruct me have authorized me to say, that if they had (though not officially, yet if they had), received, even unofficially, any communication of the real state of the premises, they would have made no opposition to this policy; but acting as trustees for a larger body, that body prescribe the terms on which they are to act, and they are required to regulate themselves officially, according to the terms of the conditions.

Gentlemen, I dismiss this part of the subject, being satisfied you must be of opinion, when you cast your eye over the premises, that nothing is more plain than that the communication ought to have been made; they do describe the iron doors in one policy, but they omit to make the description in the other, and that omission, whether by accident or design (for I impute no fraud to these gentlemen), is equally available to me, as a defence to this action, and I think that it is a defence which the underwriters ought not to be ashamed to make in the face of the city of London, or they would put an end to all the guards thrown round this species of contract.

Then, Gentlemen, we come to the other questions, which have occupied a great portion of your time already; and, first of all, I will take the question of what actually produced the fire, because an issue is joined on this record as to what was the cause of the fire; and on that subject, notwithstanding any impression on your minds by any part of my learned friend's evidence, I feel myself a perfect conviction, that the fire did originate from this process of using oil; nay, and that the plaintiffs know it. Let me see if I cannot demonstrate that to you, by the evidence already adduced, and by the mode in which my learned friend has conducted the cause. Did you observe with what great caution, in his address to you, he laid this ground for himself, that he was not bound to account for the origin of every fire? It might be by lightning, or by some accidental coalition of circumstances which no chemist ever foresaw or foreknew on the subject; or it might be from some wick of a candle above, some wick that had burnt for several days had set fire to a hog'shead; but why should you be left to conjecture upon that point, when a most important and conclusive witness on the subject is in his power, whom he refuses to produce? Where is the man who was attending this place at the very time? where is the man who lighted the fire? where is the watchman who lighted the engine fire? neither of these are produced. Gentlemen, have you asked yourselves that question? I own I was quite astonished when I found my learned friend began to resort to his men of science, after having examined first Mr. Duke, who is a mill-wright, who had nothing to do but now and then repair the pump, this man was to give you a whole history and description (you recollect he was the first witness yesterday)—a whole history and description of the mode of conducting this business, and it turned out, on my cross-examination of him, that he had not been above five minutes in the place, and he could not say whether the machine leaked or not, or how much it leaked; but he proved Muller attended to the

process, and that he was the person who, ever since the process was used, had had the conduct of it in that place; then I took it for granted, that even if it had occupied a little more time than was necessary, or useful, when he had that important witness as to the fact, he would call him.

The next witness is the man who attends to the steam-engine which communicates with these premises, it is placed here [*points to the spot on the model*], and the engine-keeper comes in the morning, and finds that the watchman had lighted the fire for him—that watchman is not called. Now, if we are on the question, what caused the fire, I ask, whether you would not expect they would give you all the information in their power,—pray, remark that—because, in causes of this description, the Jury is entitled to derive information from evidence that is kept back, as well as from that which is adduced, and if you find the party who undertakes to shew that the fire was not created by this process, keeps away his servant who conducted the process, how can you be satisfied, that he was of opinion, that that man, if called, would not have put him out of court. The watchman is not called, *Muller is here*, and is not called. Now, let us see who is called—May says, he came upon the premises at three o'clock, that he found the watchman had lighted his fire, that having stirred up his fire, he passed through the grinding-house—this story being above the earth—it is a kind of a cellar rising but little above the surface of the ground, so that he came nearly to the level of this warehouse, and having ascended a step from the grinding-house to the warehouse above the fill-house, he called down to ask Muller whether he was ready.—Ready! for what? Why, whether he had got his fire lighted under the oil, and whether he had got his sugar-pan in a proper state for him to set the engine in motion to work the pump. This happened at a quarter past three; Muller told him he was not quite ready, yet at that time being in the warehouse, and the warehouse-door being half open, and standing upon a step that just enabled him to carry his voice down to Muller below—he saw no fire in this warehouse whatsoever, he saw no light, but there was a lamp lighted in the grinding-house (the house insured) through which he passed, which lamp his master always had lighted the first thing, to enable the people to go to their work, because they pass through this room to get to the premises. They come in at the gate and pass through this room, and his master would not allow any thing but that lamp to be used, so that there was no probability of there being any light in the warehouse then; but that is not all, he goes back and remains

a quarter of an hour, and then returns, and asks Muller if he is ready. Muller says he shall be ready in a few minutes (I shall make use of these facts by and by for another purpose), time, and at that time, when he comes back, which was only a quarter of an hour or twenty minutes, before the alarm of fire, there was no appearance of fire in the warehouse, and nobody was in it. But it does not rest there; you have the mill-wright, who at eight o'clock left the premises, and you have the engine-keeper at nine in the warehouse, every watchman being gone, and no trace of fire or light in it. At nine, the last person in the warehouse left it without any light in it; at three, the same person saw it without any light; at a quarter past three, or from that to half past three, he saw it again without any light, and a few minutes after, when he was at the engine-fire, he heard an alarm of fire, which must have been very sudden; and then what takes place?—You will find what takes place then is perfectly consistent with the whole case I shall prove, which will shew, to demonstration, that the fire originated from the cause I will state to you; he goes back to a door which he describes to be hereabouts [*pointing to it on the model*], and he is correct, keeping the steam-bin on the left; he says, that the door was a-jar.

*Mr. Serjeant Lens.*—He pulled the door to him?

*Mr. Scarlett.*—He opened it to the left, and saw the fire to the left, the appearance of a flame or fire on the floor. You will see, by and by, whether, if an illumination was to take place in the steam-bin, which is glazed, and a man coming in here, whether a sudden blaze might not be supposed to be a fire on the floor; or, it might be then on the floor. What has become of Muller? He was in court, I never was more astonished, than at finding he was not called. Having heard my learned friend state the plaintiffs were respectable men (which I do not dispute), and though counsel sometimes have to manage cases in a way in which they would not wish, I have no doubt my learned friend has exercised a sound judgment, and by withdrawing Muller, has taken the only course that gives him a chance of your verdict. I hope, however, that will not avail him, but that, with your experience, you will look with great suspicion to the party, or counsel, who does not adduce the most important evidence, and asks you to conjecture, when he might prove the fact. The watchman and Muller are not called, and if there was another man, he is not called; and you are to conjecture now that the fire took place by some unimagineable accident, by something that illuminated upon that floor, and descended into that house, where it was seen by May. But where did he hear the alarm of fire from? who



gave the alarm? and how came that person to give it? it was not the watchman in the street—it was clearly Muller, and he is not called. I may safely say, you have no evidence to satisfy you there was a lighted candle, or torch, fire, or smoke of any description, in the warehouse, at three, or half past three in the morning; but that there was a fire here, it is quite clear. Now, Gentlemen, you are asked to come to this conclusion, that you, trying the question what caused the fire, are to suppose the fire originated in a place, where all the witnesses called, prove there was no flame, candle, or smoke; and that it did not originate in a place where there was a fire, which had endured for an hour; is there any thing so puerile? can you come to the conclusion? Fires may arise from an accident which no man can comprehend; but when you find there is a fire in one room, and none in the other, and you are asked to conjecture what caused the conflagration, surely—surely it must have originated in that room where the fire was.

Now, I proceed further on that part of the case, in the consideration of which I must mix up the other question of the increase of risk: but, first Mr. Wické is called, and Christian Lamp is called; what light they throw upon the subject, I do not know. Mr. Wické threw some obscurity, for Mr. Wické is aroused by the watchman in the street, and after being aroused, he goes and sees what is passing; but the watchman who sprung his rattle, my learned friend does not call—I will call him to you: he is not a servant of the plaintiffs—the plaintiffs may not have discovered where the watchman is, but I will call him, and you will hear his description, and how exactly it tallies with all the science, of which I am informed from my brief, as to the most probable occasion of the fire. Suppose this should happen—suppose you should find a man in the street first saw an immense flame force its way through these windows (you see there is a continuous window)—let me suppose, Gentlemen, that a man in this street should have seen, through that window, an immense flame bursting forth at once, not with a loud explosion (which I will explain), but an immense flame, breaking the glass, and shooting across the street, and rising up by the opposite houses, do not you think he would furnish some light upon the subject? should you not think it an answer to the conjecture of the plaintiffs, that it originated in the floor of the warehouse? must it not have arisen from some sudden and violent cause? I will prove the fact to you; I will prove it was seen, and the man who saw it told the watchman, who saw the same thing, and sprung his rattle; and then came on

the stage my learned friend's witnesses. The two first he does not call; and, therefore, I think you must be satisfied of two things, first, that the plaintiffs have not laid before you the evidence they might have adduced, to prove what did give rise to the fire; and, secondly, that upon all the evidence you have before you, it is contrary to all probability, that the fire arose where there was neither light or fire, but that it must have originated in the fill-house, where there were both; and I think you will find a high probability, that in both these positions I am correct.

That brings me to the third question, the increase of risk. Now, Gentlemen, upon that subject, I am aware you have the opinion of many gentlemen, of all of whom I speak with the respect that is due to every witness who is unknown to me, and as to some of whom I cannot speak but with great respect. I wish Mr. Brande, and a gentleman opposite me (Mr. Parkes), a man of great respectability, had conducted the same process of experiments that I shall prove, because they would, I have no doubt, have come to the same conclusion as my witnesses; but it is not from one or two experiments that a matter of science is to be established, more especially on the subject of chemistry, which (although entertaining) is the most fluctuating in the world. I remember, in early life, I attended the lectures of a learned man, Dr. Milner, at Cambridge, who was a chemist of great skill; he had succeeded the late Bishop of Landaff; at that time prevailed the phlogistic system, and it was prevailing so much as to run away with the greater part of the established authorities in science, and Dr. Milner certainly gave brilliant lectures on the subject, and adopted that theory; and I attended them, and was much struck with the beauty of the experiments; but it happened to me to form an intimate acquaintance with the late Dr. Hind, who afterwards presided in the same chair, a man who united a greater and more accurate knowledge of scientific information, to more universal powers of genius, than any man of his age; and he said to me, "Do not be run away with by this theory, for you will find that in a short period it will be exploded, and then there will be a totally new nomenclature;" and, in fact, I observed, shortly afterwards, that it was so: upon which I said, "Then I will not pursue this study any further, for if the names are to be changed by every new discovery, it is an endless pursuit." Gentlemen, it is easy to read theories and form opinions, but very few men can give you a fact with philosophic exactness, and that is the reason why matters of science make so slow a progress. Any man can write a

novel, but very few can write a new history. I say, this cause illustrates that observation. People are apt to generalise from one or two experiments, and this is the vice of science; one or two experiments are not a sufficient foundation for a general rule; and there are many things in the world that, within our time, the most experienced chemist has found to have new properties and new qualities which he never dreamt of before. Sir Humphrey Davy has almost worked another revolution in the names of the subjects in chemical science, so that it may, before some of us die, go through a third or fourth revolution. I say, that Mr. Wilson, however respectable he may be, was meddling with a substance of which he did not know the properties, and I shall prove that, I trust, to your entire satisfaction.

Mr. Wilson is the patentee of this new invention, and although introduced by my learned friend as one among a great variety of processes to boil sugar, it turned out that there were but two, namely, the application of steam, and the application of the oil; for as to the mere alteration in the form of the furnace, that is not a new process, for it is still applying fire to the bottom of the pan, and whether you condense a fire, or increase or diminish it, is the same thing. But it turned out that there was only one individual he could speak of, that ever applied this to the boiling of sugar, and that in a different way, which was not attended with any danger—the boiling it in an open pan; but in London it has never been used till Messrs. Severn and Co. used it. Mr. Wilson wanted to insinuate that Messrs. Craven and Bowman had adopted it, but all they had done was to allow this gentleman to make experiments in a detached building from their sugar-house, upon oil; they never introduced it into their sugar-house, and finally, they rejected it; and I will prove the reason of it—they thought it too dangerous. Now, I ask you, whether, in an invention altogether new, that has never been applied yet, until the present case, to the process of boiling sugar, in this large metropolis, which contains more sugar-houses than any other place in the world, the Office is by intuition to know that this is the process made use of, or ought they not to be informed of it. Mr. Harris, at Liverpool, when only boiling it in an open pan, represented it to the Company at Liverpool: he stated that the risk was not greater than in boiling tallow, but he thought it right to communicate it before he made the alteration; surely, then, gentlemen, by their own conduct they shew that the communication ought to have been made, and yet there is no such communication in the present instance.

But we come to the increase of risk. The case made out by the plaintiffs upon the subject of the oil is this: They say the process of boiling sugar by the means of oil, is attended with less risk than the ordinary process of fire applied to the bottom of the pan, for two reasons—first, because there is great danger in boiling the sugar in the pan; because, say they, sugar at  $350^{\circ}$ , and from that to  $370^{\circ}$ , emits a gas highly inflammable, and if it boils over into the fire, it may be attended with danger:—on that part of the case they produce only one sugar-refiner, a gentleman of the name of Robinson, and Mr. Harris of Liverpool; Mr. Harris was not asked on that.

*Foreman of the Jury.*—He said it required incessant vigilance.

*Mr. Scarlett.*—Yes, but I defy my learned friends to show an instance of the pan boiling over. Mr. Robinson, an ingenious man, is brought here in favour of the plaintiffs;—an ingenious and compassionate man;—and he says, he never knew an instance of its boiling over. The sugar boils, for their purpose, at a heat of  $240^{\circ}$ , and if it were to exceed by 10 or 12 degrees that heat, it would ruin their process; and therefore they have the means of damping the fire, and that interest (which is, after all, the best security, whenever you can bring it to operate constantly on a man's duty), renders the old process a perfectly safe thing, and goes to prove that sugar will not boil over. I believe none of the fires which have happened in sugar-houses will be found to have been produced by the sugar boiling over. The real risk is this, it is what the witnesses have described to you, that the number of fires in different parts of it multiply the general risk, and the extreme heat of the process presents a more combustible mass of materials to any body of fire, than is to be found in any other building.

I should be glad if my learned friend had called a witness to shew, that the sugar ever came to 350 degrees. You get a chemist to swear that, or that it emits a gas or vapour; but did that ever happen?—No.

The next part of their case is this:—They say, that as sugar is liable to boil over, and may boil over in an inflammable state, if they can apply a process which will prevent the fire being under the pan, as there is no fire for the superfluity to fall into, there is no danger of ignition. Now that appears to me a perfectly peurile argument; it resolves the whole danger to the pan boiling over, a thing which they have not proved ever to have existed from the beginning of time:—I say, that is not the danger.

But the witnesses, in giving that opinion, say they can bring, by the process of oil applied to the sugar in this form, a degree of heat sufficient for the purpose of the sugar, without the risk of having a fire for the over-boiling sugar to tumble into—good; but they assume there is less danger in boiling the oil,—and some of them (conscientiously no doubt), assume there is no danger in it; there I join issue with them. I will demonstrate that to you; I have taken all the pains to inform myself on the subject, and entertain no doubt that I will satisfy you, that they are mistaken in that; and that the properties of oil were as unknown to Mr. Wilson, as some of the effects of it were to the chemists.

Now, see the varieties in their evidence:—Mr. Wilson proves that oil, in whatever state as to its former use and qualifications, by heat, exhibits no difference, but that fresh, or what he calls old oil, exhibits no difference on the application of heat. Mr. Parkes says, there is some difference; a difference of 10 or 15 degrees, comparing the oil Mr. Wilson brought with the new oil, on a small scale. Other witnesses are called, who were present at Mr. Cooper's; for the great mass of evidence has been only a repetition of the same experiments; a great mass of them are confined to Mr. Cooper's experiments, and the only note I have made on my brief is "Cooper's Experiments," which I have taken down to surfeit. Mr. Cooper has made other experiments since, privately, and has found the results the same; but the great mass of evidence is to prove his experiments. Observe how they differ from Mr. Accum. Mr. Accum has stated, that when he tried old oil, he found it produced at  $460^{\circ}$  the same effects as the new oil did at  $600^{\circ}$ . Observe, Gentlemen, he makes a difference;—I will take his evidence that I may be accurate,—my learned friend's notes confirm me,—Mr. Parkes finds it to be  $585^{\circ}$ , I think —

*Mr. Parkes.*—Five hundred and eighty-six degrees, I think.

*Mr. Scarlett.*—At  $586^{\circ}$  he found the old oil, which had been two years used, for six hours a day, several times a week, produced the same effect at  $586^{\circ}$ , which the other did at  $600^{\circ}$ ; here is Mr. Accum producing at  $460^{\circ}$ , the same effect upon the same oil; a difference of no less than 120 degrees. You see Mr. Parkes has made an observation, that one oil might be used more than the other—to that observation I attach more importance than he is aware of; now Mr. Accum, who gave his testimony with great clearness and distinctness, stated all he knew; are you not satisfied then, that Mr. Wilson's experiments and knowledge, are not quite so certain on the subject, and that he is not free from doubt and difficulty;

recollect, Gentlemen, this is the evidence of the plaintiffs. Gentlemen, you cannot believe that oil is quite so safe as Mr. Wilson represents, if you believe Mr. Accum, who says, that when it has been long used, it produces certain effects. All those persons who have been accustomed to work in oil, and to use it, (and I shall call some of them before you), from long experience know, that the oftener it is heated, the more inflammable it becomes, so that at a certain period, which is not always assignable, for it depends upon varieties in the experiments that no human genius can control. Gentlemen, I will prove, that at particular periods it will produce, even at  $310^{\circ}$ , effects of combustion, and all the dangerous effects that I impute to this operation, which new oil would produce at  $600^{\circ}$ . That may surprise some of the Gentlemen, but you will find that those who are accustomed to extract the oil from blubber, and who have attended to it with a chemical exactitude, make it a rule never to let it become hotter than  $310^{\circ}$ , and very often, when it gets beyond that it becomes uncontrollable; one of the greatest chemists alive doubted the propriety of this operation. But it often happens, that oil in a particular state, if you take it suddenly off the fire, will continue its operation for several minutes, and produce danger even when taken off the fire. You will find this, and I will shew you (I will not shew the experiment, but I will shew you), the produce of oil in a certain state. This is merely for the purpose of illustration. I hold in my hand a vial, perfectly cool, and free from all appearance of combustion: this is the result of new oil, distilled at a heat necessary to make it pass freely over from the retort into the receiver, to exhaust itself into steam or vapour, and then condensed, from which is extracted this substance, which is a species of naptha. If I were to take the cork out and put a light to it, it would flame immediately; if you inserted a taper, it would explode without noise. I have seen it done: this is new oil, it is the first operation of distillation of new oil. In order to produce this with the new oil, you must bring it to above the heat of  $600^{\circ}$ . Now, what will you say, if I prove to you, that on the application of heat, for twenty three days successively, to new oil, the same effect will be produced at  $410^{\circ}$ , which the new oil does not produce under  $600^{\circ}$ . The application of heat to it, produced effects which you cannot calculate before-hand. You will remember what the witnesses have sworn, that the old oil produced inflammable gas, permanently inflammable, (and I put that question, from a suggestion of the witness behind me, as to the meaning of the term "permanently inflammable gas;" it can only burn till it is exhausted; a

spoonful will burn out in a moment, but a gallon will last longer), but permanently inflammable gas is not a proper expression. You observe the evidence is, that that gas, which they say requires a continued application of fire to keep it alive, may be produced at a lower degree of inflammability, but that the gas which will burn without the continued application of a taper, they say, can only be produced at  $586^{\circ}$ , with old oil; and never less than  $630^{\circ}$  or  $640^{\circ}$ , according to Mr. Wilson;  $460^{\circ}$ , with old oil, according to Mr. Accum; and according to this experiment, I will shew you, that one of the most combustible things in nature, when quite cold, is produced at  $410^{\circ}$  with old oil; which can only, in new oil, be produced at  $600^{\circ}$ . That shews a danger in the article which Mr. Wilson seems ignorant of, and yet he is the patentee for introducing this to sugar-houses.

Gentlemen, I will lay before you evidence to shew, that those who have been concerned in extracting gas from oil, which has now become a trade, (and they must know something of it,) are aware of the danger and difficulty attending all operations of heating oil; they are obliged to heat it to a great excess, but they must go through the intermediate degrees; and they will tell you they are satisfied of the extreme danger of it; that it requires skill and caution which scarcely any other combustible matter requires.

These things being explained to the Office, they thought it became them to make the most accurate experiments, conducted by the most intelligent persons, to lay before you the nature of this thing; because it is not the opinion of a man of science that will always satisfy a Jury; but, to illustrate the ground of their defence, they desired that the most accurate experiments might be made, the details of which I will communicate to you, and then you will apply them to the particular facts in this cause, as to the occasion of the fire.

Gentlemen, you will find that a quantity of 24 gallons of oil was exposed to a heat of between 3 and  $400^{\circ}$ , for twelve successive days, and I will give you the result, as I have it in writing; it was fresh, good whale oil. Gentlemen, you will see that this operation in this house began at an early hour in the morning, and continued till seven or eight at night. Our experiments were carried on, on the same principle, and there were two persons to superintend it; and you have an account of the effects of the oil each day, and you will find it varies each day in its effects; but that very circumstance furnishes a strong objection to the use of the article. In the first day the heat never exceeded  $300^{\circ}$ , no inflammation was produced; the oil was put into a confined

vessel, with a tube over it, to allow the gas to escape, bringing it as near as possible to the construction of this vessel: on the second day, on applying a light to the end of the tube (now I should have been glad if Mr. Parkes had been a party to these experiments,) at a heat of  $375^{\circ}$  only, on the second day, (the tube being at a height of some feet above the surface of the vessel,) upon applying a light to the end of the tube it took fire, and burnt, but with a very gentle flame. On the the third day the same effect took place at  $395^{\circ}$ ; on the fourth day at  $344^{\circ}$ ; the vapour was inflammable, and to a greater degree than on the former day; and the heat was suffered to increase on that day, and the fire was made up quickly; and, it was found, that as you made up the fire quickly a greater effect was produced; it was brought to a higher temperature than the same quantity of fuel gradually added, so that a stronger effect was produced by the sudden application of fire, though producing only a given temperature, than when slowly produced. You will find the heat at  $365^{\circ}$ , on the fifth day; on the sixth day, at  $360$ , a standing flame was produced at the end of the tube, which continued burning. I will apply this by-and-by to the case before us. On one occasion, at seven inches and a half from the top of the tube, it took fire, and burnt with a strong flame; and at that period the cause was about to be tried here last February, and the experiment terminated with that; but the cause being put off, they thought it their duty to make a larger experiment; and you will find, that 24 gallons of oil were put into a vessel, constructed as nearly as may be like this, and twenty-three days in succession a heat of  $360^{\circ}$  was applied to it, according to a witness who took the greatest possible care, and he will swear it did not exceed that on any one day above five degrees; and at the end of the twenty-third day—I will call before you several gentlemen (chemists of acknowledged character,) Mr. Ferreday, the experimental chemist of the Royal Institution; Dr. Bostock, of Liverpool; Mr. Children; Mr. Garden; Mr. Martineau, a chemist and sugar refiner, and several other gentlemen whom I will not name, of most perfect credit, and they will tell you that when this had been heated twenty-three days, in the way I have stated, and allowed to cool every night, they tried experiments with it; they found it highly inflammable, and that it produced this, which is a thing that for the present you have heard nothing about; it was not my business to examine gentlemen on theoretical and conjectural points.

The oil produces an aqueous vapour originally, but it



produces a vapour to the last, distinct from the gas, and that is heavier than the atmosphere, and descends whilst the gas is inflammable, and escapes, being lighter; and that vapour, which sometimes exhibits a colour, collects in a sort of cloud, and is highly inflammable; it is extricated at  $410^{\circ}$  from oil thus used. I will shew, that from experiments carried on for twenty-three days, that is to say, the oil being used every day, it is found so far to have altered its properties, as to exhibit all the combustible effects at  $410^{\circ}$ , which the other side state to have been produced at the highest temperature, and in twenty minutes time the application of the same degree of heat will bring it to the highest state of inflammation.

Gentlemen, I shewed a little pot of viscid matter to Mr. Accum,—oil which Mr. Accum thought had been six months boiling; it was only twelve times boiled,—and it is quite tenacious like glue, but the moment it begins to dissolve by heat, after many days boiling, it becomes extremely volatile; so much so, that you will be surprised to hear, that after these experiments, upon bringing the heat to a little above  $400^{\circ}$  for a short time, the oil itself rose out of the boiler, and ascended through the tube to the ceiling, seven feet high. Fresh oil does not boil under  $600^{\circ}$ , but it burst up here, and was near setting the premises on fire, and they were obliged to stop it. This is the article Mr. Wilson has used and recommended; and this, the article you are told, by scientific gentlemen, is a safe thing to use.

Now, Gentlemen, I will remark another thing to you;—it has been said by Mr. Parkes, that there is a great difference between essential and fixed oils; but at a certain degree of inflammation of this oil, it produces the same vapour as tar oil, when it has undergone an operation of the like kind; the tar oil, after being some time boiled, emits vapour heavier than the atmosphere, the heat that causes it to rise prevails at a certain height, and it forms in curls and comes down;—And I will shew there is danger from that, not of a violent explosion, but an explosion sufficient to break the window-glasses, but with so little concussion as not to disturb the jars in the apartment. You will find the vapour from this oil at  $410^{\circ}$ , or a little above, produces the same effect.

Now, Gentlemen, I beg your attention to this;—you observe this operation consists in a vent which carries off the vapour collected from time to time in this place; this steam-vent rises to the top of the roof, but the pipe which conveys the vapour only rises about ten or twelve feet—

*A Juryman.*—Sixteen feet.

*Mr. Scarlett.*—Not sixteen feet from the steam-bin;—sixteen feet from the boiler; but I speak of the steam-bin:—the steam vent is intended to carry off all the steam first collected in the bin, which was formed by the two pans formerly used there, and by the pan which remained at the time of the fire. The steam rises into that bin, and there is a vent to carry it off. The vapour is also carried through the bins, by means of the pipe, into the vent; but this pipe is not taken up to the extremity, but terminates in the vent; so that if the vapour should at any time be heavier than the atmosphere, when it rises a certain height in the steam-vent, from the velocity it has acquired, it would descend again—descend where? why, down into the steam-bin. Supposing it did descend, it would first occupy, in the form of a vapour, this steam-bin. Let me suppose it to be now in an inflammable state, and if it descended to the steam-bin, and a portion of it communicated with the gas-light, the whole would inflame, the steam-bin would exhibit a volume of flame, which would burst out at the window, and probably into the warehouse, and would give fire to any combustible material on that floor. You will see whether the facts I shall prove to you are not consistent with that theory; you have had a dissertation upon the effects of the gas mounting up: we have been told gas is lighter than the atmosphere,—and that is true, though I will prove the vapour is not.

Gentlemen, it very often happens that the theorists upon this subject are confuted by very simple facts. Did you never hear of a smokey chimney? Yes,—that sometimes arises from a draft in the room; and here my learned friend says there was no draft. Did you never know a change of wind cause a chimney to smoke?—I know it has cost me many pounds to prevent a circumstance of this kind:—a chimney perfectly good in one state of wind, will have the smoke driven down it in another: and I am told that the very construction of this place, which does not allow the vapour and the gas to rise up in a right line, but permits the wind to blow down and form an eddy within, is the most likely thing in order to produce that effect which is produced in smokey chimnies, where the current drives the smoke into the room; and though I do not say this was the case, it might have been the case. On this morning it was a rainy morning, the rain was incumbent on the atmosphere,—and you cannot have a better criterion for the state of the weather than by the smoke descending; therefore, even the gas itself might have been forced down by the wind which formed an eddy in the top of the steam-vent, and drove it down; and though the gas escapes

to the middle of the steam-vent, if an eddy is formed in the top of the vent, it will drive it down, and add to the inflammability of the vapour there before. But, says my learned friend, that steam-vent has a draft up it to carry off the steam from the sugar pan, which has a propelling force upwards:—but the sugar pan was not at work. You will recollect that Muller was not ready,—Muller did not set his whole machinery at work, so as to begin to use the pump:—Attend to that:—You will find it a most important fact in the cause, which my learned friend well knows, or you would have had Muller, no doubt. The object of this pump is to bring the oil at a certain heat into the pan, and there it revolves again to the reservoir, so that when it spreads, my learned friend said, like the blood from the heart, it circulates through the different vessels, and then it comes back to receive its due portion of heat again: from which it follows, that you must keep this at a greater heat than you intend it to be at, when it finds its way to the sugar: you must raise it to a high degree of heat in the boiler, because if you brought it to only 360° or 350°, at which my learned friend said (*gratis dictum*) is the greatest heat necessary——

*Mr. Solicitor General.*—Mr. Wilson said it.

*Mr. Scarlett.*—He has not proved it, because he has not called the man who worked it; but this is plain, that he must bring it to a degree considerably above that where he first sets it off, to keep it up at the average afterwards.

*Mr. Mavor.*—Mr. Wilson says 340° to 360° was the working point.

*Mr. Scarlett.*—I will shew that Mr. Wilson, on another occasion, brought it to 400°; but no matter for that, Mr. Wilson might give directions to the work people; but I say, the man who had the practise for three months, is the best judge of what was necessary; and my learned friend does not call him before you, therefore you are left there to conjecture. Here is a thermometer going to 440°, by which he can regulate the heat; but before he begins to work this off by the pump into the pan, inasmuch as the pan consists of cool materials, he must raise his boiler to a considerable degree of heat to produce any effect; because, in proportion as the sugar gets hot, it tends less to cool the oil in the tube; while the sugar is cool, it requires more heat in the oil to produce any effect; therefore he naturally at the beginning, works his oil to a greater pitch of heat, than at any other period of the day, because when once it is hot, he can keep it at an average heat of what you please; but, before that, he must raise it higher, and whilst he is doing that, (and I beg your attention to

that), the pump is not at work; and the steam, and vapour, and gas, have no vent to escape, but by that very tube into the steam-vent; and it is wholly unaffected by any operations of the pump, or any cooling of the liquor. Muller is not ready—"do not set the pump at work yet, I am not ready:" why not? either because I have not my sugar-pan ready, or because I have not a proper state of heat; and whilst he is bringing it to a proper heat, you must not set the pump to work, and it is clear that, during that time, this sudden inflammation took place. I shall shew that a man walking the street, saw an immense flame burst out of the windows; I shall shew you, that a man opposite saw the same thing, and the watchman saw the same thing; and all this before they call a witness, and they do not call Muller. I shall adduce witnesses to you, to prove that a vapour ascends from the oil in the various stages, and that it is inflammable, and heavier than the atmosphere, and that it may, if lighter, even descend and find its way to the steam-bin, and that when the gas-light is lighted; if any portion of it descends at the time, coming suddenly down the steam-vent, to the gas-light, a blaze will take place, no noise will be made, except what is necessary to break the windows, and it flashes out with great force into the street.

But, Gentlemen, for what I know, the oil itself might have poured down from this very vent, and have increased the combustion below; because I will prove, that, in one of our experiments, at a degree far under  $500^{\circ}$ , ( $460^{\circ}$ ) the oil itself rose up, like a fountain, through the tube above, and poured down into the fire. In the case before us, there was a sudden alarm of fire, and in the meantime this great fire was bursting out of the window, which astonished the man outside; and if the oil had poured down suddenly, it would have produced a considerable conflagration. I think all the evidence, considering what I shall produce, furnishes as strong a body of evidence, of the immediate cause of the fire, as could be adduced in such a case before the Jury.

Gentlemen, one other observation, and I have done. You hear the thermometer is graduated to  $440^{\circ}$ , and Mr. Wilson has admitted, that a thermometer will have the quick-silver suspended when the bulb is broken; it is immersed three inches in the liquid; in the using the oil to boil, nothing is more common than for the thermometer to break, and then the state of the mercury in the tube is no indication of the actual degree of heat, and you will be told, that it is the most difficult thing to get a thermometer to act. I do not say that this burst, but all these circumstances shew the increase of the

danger; it is admitted by the witnesses on the other side, that if you bring the oil to a certain heat, danger may be apprehended; they have a thermometer to keep it down; if that bursts it is fixed, and he sees nothing but the graduated scale outside, the bulb is confined, and if that bursts it ceases to be an indication of the heat, and therefore the most skilful man might raise it to a height to produce combustion. I submit to you, that upon all the difficulties, all the ignorance, all the various circumstances that combine to render more skill and caution necessary in this, than in the ordinary course of boiling sugar, you will come to this conclusion; that it is more dangerous than the other, more especially when you take a workman to do it.

The questions then are, first, did the fire arise from this cause? secondly, is this mode of boiling sugar, or is the introduction of heat, by the means of oil, a dangerous thing, or does it increase the hazard? you have had no evidence of any sugar-refinery being burnt from the sugar-pan boiling over. In August this thing is set to work, in November it is destroyed; there is no fire near the premises, but the fire under this pan; there is no witness to explain it, but one who is not called; the question is, therefore, what probably caused the fire: I shew you, that the oil might have produced it, and I shew the outside appearances, to render it probable that the oil did produce it; and when you find that the fire must have taken place about the very period when the oil would become most dangerous, because this oil was boiled three months, which might alter it, and the witnesses think, the longer and the oftener it was heated, the worse it grew; do you not believe this to be more dangerous and hazardous than the ordinary process, and that it set fire to the premises. Gentlemen, it appears to me, that you cannot doubt the fact, and on either of these points, the verdict will be for me. So also, if the description is not accurate, I am entitled to your verdict; because, in the new policy, there was no description of any communication by iron doors.

**EVIDENCE FOR THE DEFENDANTS.**

**SAMUEL WILLOUGHBY, Sworn.**

*Examined by Mr. Serjeant Blossett.*

Q. What are you? A. I am a porter.

Q. In whose employ? A. I am a fellowship-porter.

Q. Do you recollect this fire? A. Yes, I do.

Q. Where do you live—how near the premises?

A. I live in Charles-street, N<sup>o</sup> 10.

Q. How near is that? A. I suppose about 100 yards.

Q. Out of Union-street, or Holloway-street?

A. It leads out of Holloway-street, one end leads out of Holloway-street.

Q. Did you come out of your house that morning?

A. Yes, about six or seven minutes before four o'clock.

Q. Upon going out of your house, which way did you go?

A. I came up Little Holloway-street towards the building.

Q. Coming out of Charles-street, and going up Little Holloway-street, would bring you to the corner of the buildings made by Holloway-street and Mulberry-street?

A. Yes.

Q. Upon coming up to the corner, did you perceive any thing particular, and what?

A. I did not, till I came up to the corner of the building.

Q. You saw nothing particular till you came to the corner?

A. No, I could see the building before I came to the corner, because it lay in a direct line.

Q. Did you observe any thing particular?

A. All of a moment, a body of fire, and a window blew out.

Q. Looking at the model, which window was it?

A. The window towards the corner, next to the Mulberry public house; this window, I suppose, that is, the window towards me, the big window.

*Mr. Scarlett.*—The building was on your right hand side as you came down? A. It was on my left.

Q. As it is now?

A. Yes, if I had been opposite the window, I suppose, I never should have told any body any thing about it, for I should suppose, if a horse had been there it would have knocked him down.

*Mr. Serjeant Blossett.*—It was a body of fire?

A. It was a body of fire, with no smoke at all.

Q. You say no smoke? A. I saw none.

*A Juryman.*—Did the flame burst out below, or above the floor?

A. The whole of it came out—the whole of the window came out.

*Mr. Serjeant Blossett.*—Both above and below that floor?

A. Yes, it was about twenty yards before me, which quite startled me, and I gave an alarm immediately.

Q. If you had been opposite, it would have knocked you down? A. Yes.

*Lord Chief Justice Dallas.*—You saw no smoke?

A. No, it was a complete body of fire.

*Mr. Serjeant Blossett.*—How broad is the street there?

A. I never measured it.

Q. Did you see the effect it had in passing across the street?

A. Yes, it is a wide street, it burst out across the road before it ascended, and then it ascended up the wall.

Q. What wall? A. The brick-wall of the building.

Q. Of the opposite side? A. No the same side.

Q. Did you observe the floor above, did you see any light in the floor above?

A. I saw none, there were lights up towards the top of the house, and I halloed, but I could not make any body hear.

Q. You did not observe any light in the floor above?

A. No, but there were lights on the upper-part of the building, as though some of the men were at work.

Q. Do you remember what kind of a morning it was?

A. It was a wet morning, it rained a little when I came out from my house.

Q. Before you saw the flame, do I understand you to say, whether or not you observed any lights in the story immediately above that? A. I did not.

Q. But some in the upper-part of the house?

A. I saw lights in the upper-part of the house, after I gave the alarm, because I wanted to make the people hear, if possible, to get out of the building.

Q. You gave the alarm? A. I did.

Q. Whom did you see first?

A. The first person who came up was the watchman, who sits in a little box next to my house; and I said, for God's sake spring your rattle, for here is the building all in flames: and the first person who looked out was Mr. Lawes, at the public-house.

Q. What public-house?

A. The Mulberry-tree public-house, at the corner of Holloway-street.

Q. Supposing this to be the corner of Mr. Severn's premises, where does the public-house stand?

A. On this side, in the corner.

Q. Is the Mulberry-tree on the right, or the left as you went?

A. On my left.

Q. Where were you when Clayton came up to you?

A. I was against the building, the corner of the building.

Q. What is the watchman's name? A. Clayton.

Q. Where were you standing when he came up?

A. I was standing close to the corner of the building, and calling out.

Q. What did you do?

A. I did nothing more after I gave the alarm in the neighbourhood, I went back to my wife, to tell her not to be uneasy, and then I went to work. I had business to attend to at the time.

*Lord Chief Justice Dallas.*—Six or seven minutes before four?

A. Yes, it wanted ten minutes to four, when I came out, and I was up to the building in a couple of minutes, or so.

*Cross-examined by Mr. SOLICITOR GENERAL.*

Q. I wish to know where you were, at the time you first saw this appearance?

A. At the corner of the building, within a yard or two.

Q. How far from Lawes's house?

A. Opposite to Mr. Lawes's house.

Q. You were close to that house?

A. I have been in the habit of passing the building every morning.

Q. Were you near Lawes's house?

A. I was coming along towards the building, opposite his house.

Q. At the time when you first made this observation, you were in the street, opposite Mr. Lawes's house?

A. I was against the corner of the building, within a yard or two, I cannot say exactly to an inch.

Q. Were you, or were you not, at that time opposite Mr. Lawes's house? A. I was at the corner of the building.

Q. Were you opposite his house?

A. It does not lie exactly opposite.

Q. You were not opposite his house then? A. No.

Q. Had you got beyond Mr. Lawes's house? A. Yes.

Q. How far?

A. I cannot tell how far, the streets are not very wide there, I suppose Mulberry-street is not more than seven or eight yards across.

Q. How far were you beyond his house?

A. About seven or eight yards from Mr. Lawes's house.



Q. Beyond the house? A. From the building.

Q. Beyond the house in the corner from which you had been coming? A. Of course.

Q. There is a whole row of windows on this side of the building?

A. There is, of course, along the side of the building.

Q. Is there not a whole row of windows on that side of the building? A. Of course.

Q. And you were on the same side as the building?

A. I was.

Q. It was before day-light, I believe?

A. A little before four o'clock.

Q. Before day-light? A. Yes.

Q. You had some conversation with Mr. Lawes, I believe, upon the subject?

A. At the time Mr. Lawes looked out of the window, he said, turn on the main.

Q. Have you not had some conversation with Mr. Lawes upon the subject?

A. No, I have had no conversation about it.

Q. Have you never said any thing to Mr. Lawes, as to the place where you were, when you saw the fire first?

A. We have had no conversation.

Q. Have you never said in Mr. Lawes's tap-room——

A. I have said, I was at the corner of the building.

Q. Have you not said in his presence, and in his tap-room, where you were at the time you first discovered the fire?

A. I have mentioned I was at the corner of the building at the time it burst out.

Q. That you said in Mr. Lawes's tap-room?

A. Yes, I certainly did.

Q. Do you mean to swear that you did not in Mr. Lawes's tap-room say, you had not got as far as Mr. Lawes's house when you discovered the fire?

A. I could not say that, because it was quite false.

Q. I ask you, whether you did not say in Mr. Lawes's tap-room, and in his presence, that when you first discovered the fire, you had not got so far as his house?

A. No, I did not.

Q. That you swear? A. That I swear.

Mr. Scarlett.—You have not seen this model before to day, have you? A. No.

Q. Do you know the windows of this building, so as to distinguish the one from the other?

A. Yes, I have known the windows; I have been in the habit of passing them these two years.

Q. Which of the windows was it?

A. The first long window, near the centre part of the building, as near as possible.

Q. Not the corner next you? A. No.

*Mr. Solicitor General.*—It was not the window near the corner?

A. No, the long window near the centre part.

Q. It was one of the windows near the centre of the building?

A. It was the first long window, near the centre of the building.

*A Juryman.*—Are there any short windows in the house?

*Mr. Solicitor General.*—You saw the fire come out at the whole of that window? A. Yes.

*Lord Chief Justice Dallas.*—There are long and short windows, are there? A. Yes.

*Mr. Serjeant Blossett.*—The model before you, Gentlemen, comprises no more than those two windows?

*A Juryman.*—These two are long, and all the rest are short? A. Yes.

*Mr. Serjeant Vaughan.*—There are only two long windows in the centre, but there are others in the building?

*Mr. Scarlett.*—It is pretended by you that the fire broke out in the corner?

*Mr. Serjeant Vaughan.*—He says, there are only two long windows, and the others are short.

*Lord Chief Justice Dallas.*—How many long windows are there?

A. I never counted them; this was a long window near the centre of the building.

Q. Was there two or three? A. I cannot say,

Q. Was it the first long window you saw the fire in?

A. It was the long window near the centre of the building.

*Mr. Scarlett.*—This is Holloway-street, and this is Mulberry-street,—now shew the Jury which window it was.

A. This is Holloway-street, and this is the window.

*A Juryman.*—Which end did you enter?

A. I came along here.

Q. Up that street?

A. I came along this side of the street; the street I came up comes in this direction.

Q. You cannot point out the windows where you saw the lights? A. No.

Q. Can you tell which story it was?

A. In different parts of the top part of the building, but I cannot say which story it was, because I was alarmed; I

could not take particular notice where the lights were in the windows at the top.

Q. Were the lights stationary, or did they seem like candles?

A. They seemed to be stationary in the place, like candles standing.

Q. Not like the light of flame bursting out? A. No.

*Mr. Serjeant Hullock.*—They were small lights?

A. Yes.

JOHN CLAYTON, Sworn.

*Examined by Mr. Serjeant HULLOCK.*

Q. You are a watchman, are you not? A. Yes.

Q. Do you remember the fire in Messrs. Severn's premises, in November last? A. Yes.

Q. What is your stand, or walk?

A. The corner of Little Holloway-street and Plumber's-row.

Q. Do you remember being alarmed by any cry of fire, early on the morning of the 10th of November?

A. Yes, I was.

Q. Do you remember about what time it was?

A. I believe it was before four.

Q. Whereabouts were you, when your attention was attracted by the alarm of fire?

A. Standing at the outside of my box.

Q. Is your box within sight of the premises of Messrs. Severn and Co.? A. Yes, it is.

Q. Upon being alarmed by the cry of fire, what did you do, or what did you observe?

A. I observed nothing, till I went up to the corner, I ran up directly.

Q. To what corner did you run up?

A. I ran up to the corner of Mr. Lawes's house, the Mulberry-tree, one end of it is in Holloway-street, and the front of it is the other way.

Q. You went up to that corner?

A. Of course, I must pass that house to go to the building.

Q. Did you then observe any thing? A. Yes.

Q. What did you observe?

A. A body of fire coming out of the window, and ascending the house.

Q. Can you state to us out of what window that fire was so issuing? A. I believe I can.

Q. Can you point it out on the model?

A. This is the window.

*A Juryman.*—The same window as the last witness.

*Mr. Serjeant Hullock.*—Will you describe to us the size of the body of fire which you observed issuing out of that window, and ascending up the wall?

A. There was a whole blaze came out of this window ascending up the wall, a mass of fire came out of the window and ascended up the wall, and I immediately sprung my rattle, and began to knock up the inhabitants.

Q. You, of course, began to make an alarm with your rattle? A. Yes.

Q. Whom did you see belonging to the premises; did you see any persons belonging to the premises who were occupied there?

A. The only person that I saw, was the private watchman belonging to the sugar-house, after I sprung my rattle.

Q. What is his name? A. Wilson.

Q. When did you see him, whence did he come, did he appear in consequence of the springing of your rattle, or what cause?

A. When I was springing my rattle, I immediately saw him standing against Mr. Lawes' door, taking down a kind of cover, he stands there in bad weather; he was taking that down, and he immediately went to the other side of the building to give the alarm. I saw no more of him afterwards.

Q. What became of him afterwards, you cannot tell?

A. No.

Q. What sort of a morning was it?

A. It was a kind of a wet hazy morning.

*Lord Chief Justice Dallas.*—Ask him if he had long been employed as watchman?

*Mr. Serjeant Hullock.*—How long have you known Wilson?

A. I cannot say particularly, I know he has been there for some years. Some few years, but I cannot particularly say.

*Lord Chief Justice Dallas.*—Ask him, if he has seen him since the fire?

*Mr. Serjeant Hullock.*—Have you seen Wilson since the fire? A. Almost every night.

Q. How many years have you been employed as a watchman? A. Between eleven and twelve.

Q. Has Wilson been there all that time?

A. No, some few years he has.

Q. And he is there still? A. Yes.

*A Juryman.*—Did you see any lights in the top of the house?

A. I did not. I did not stop to take that notice, but went and called the people up.

Q. Did you see that volume of fire which the other witness spoke to? A. No, I was not up at the time.

Q. Do you know which is the window of the fill-house?

A. I never was in the house.

Q. Did you go up to the fill-house after you gave the alarm? A. No.

Q. Did you see any fire in the place when you looked into the window? A. The place appeared all one body of fire.

Q. Did you see fire in the fill-house?

A. Through the window, the inside seemed to be a body of fire.

Q. Did you see fire in the fill-house when you looked in at the window?

A. I cannot say, I do not know which it is; when I looked in at the window, it appeared to be all a body of fire, and it was issuing out of the window.

Q. What colour was the flame you saw bursting from the window? A. Red, the same as any other blaze of fire.

*Mr. Solicitor General.*—And it continued burning after?

A. Yes.

*Mr. Scarlett.*—Did the flame outside continue burning?

A. Yes, the flame from these windows scorched the windows on the other side, so that the engines could not stand there to play.

*A Juryman.*—What breadth is Holloway-street?

A. I do not know.

Q. As broad as Cheapside?

A. I do not think it is much wider than this Court.

Q. Was there any explosion when the fire broke out?

A. I do not know. I was not up there at that time.

*Mr. Serjeant Vaughan.*—You saw it first in the window?

A. Yes.

Q. And afterwards you saw it in the bottom range? A. No.

Q. You said after the ground range caught fire, what did you mean by that?

A. The bottom range is generally called cellars, here is the pavement here, and this I consider the ground floor.

*Mr. Solicitor General.*—That is where you saw the fire?

A. This window went from the bottom up to the top, all one window.

Q. What window did you look in? A. I looked in there.

A. You stooped down to look in?

A. I had no occasion to stoop down, the first floor is above the ground.

Q. Did you stand still without stooping?

A. I stood as I do now, and the window was all of a blaze.

Q. You looked in at the window opposite your face?

A. I looked into the window where the fire was burning.

Q. Standing upright, as you are now?

A. I am not upright now.

Q. Standing about as upright as you are now?

A. I stood in that position that I could see into the window, and I went and gave the alarm, and called up the inhabitants.

Q. From the time that you first saw it, it continued burning?

A. Yes.

Q. Coming out of that and the other windows? A. Yes.

Q. Did it come out of the other windows at the same time?

A. No, it extended along to Union-street, at the bottom part of the building.

A *Juryman*.—What height is the window, is it twice your height?

A. It is a good deal above my height.

Mr. *Scarlett*.—Did you see the flames burst out of more than one window?

A. One window only.

Q. Did that flame appear to you to proceed from all parts of that window?

A. It appeared to come out about this part of the window. [*describing it.*]

Q. That is the part through which you looked into the fill-house?

A. Yes, I do not know that it was the fill-house.

Q. But where you could look into what you call the cellar?

A. Yes.

Q. Were you near enough to see what became of the glass?

A. No, I did not look after the glass.

Q. When first you saw it, was the flame coming out of it?

A. It was.

Q. Did you afterwards observe whether the other windows shewed flame?

A. All along the range of the building to the corner of Union-street, underneath the bottom windows were all in a blaze.

Q. How long was that after you saw the first window?

A. It did not exceed half an hour, I suppose; I cannot say particularly to a few minutes.

Q. Are we to take it, in about half an hour the flame came from the other windows?

A. Yes, all along.

Lord *Chief Justice Dallas*.—Do these premises lie within your beat or round, as a watchman?

A. Part of them.

Q. How long had you been your round before the fire broke out?

A. I was up there at half past three, I went and called Mr. Willoughby at half past three.

Q. Did you see any smoke issuing from any part of the building then?

A. I did not perceive any thing.

Mr. JOHN YOUNG, Sworn.

*Examined by Mr. Pollock*

Q. I think you are clerk to Mr. Lockie? A. I am.

Q. Was Mr. Lockie employed by the plaintiffs upon their premises, previous to the fire? A. He was.

Q. He is a Surveyor, is not he? A. Yes.

*Mr. Serjeant Vaughan.*—Surveyor to the Phoenix Company, I believe?

*Mr. Pollock.*—For what purpose was Mr. Lockie employed, previous to the fire?

A. To make a perspective drawing of the premises.

Q. How shortly before the fire happened, was that?

A. I was there within three or four weeks of the time of the fire happening.

Q. How often were you at the premises?

A. Several times; I cannot say how many times.

Q. Were you there often enough to become acquainted with the nature of the premises?

A. Quite so, I should think.

Q. Did you learn the communications that existed from one part to the other? A. Not at that time.

Q. Have you subsequently learnt it?

A. Mr. Lockie has, and I have myself, some part of the premises.

Q. From whom? A. From having seen the premises.

Q. The grinding-house is in the centre? A. Yes.

Q. What is called the long sugar-house, I think, is that which is towards the jury-box, in the model? A. Yes.

Q. That is the name of the part of the premises where the fire broke out? A. I understand so.

Q. And the new sugar-house is at the end, towards Mulberry-street? A. Yes.

Q. Have you ever seen that small model before, of the whole premises? A. Yes.

Q. Does that correctly describe the state of the premises before they were burnt down?

A. To the best of my knowledge it does.

Q. Do you know whether or not there was a communication between the grinding-house and long sugar-house?

A. I believe there was.

Q. When you say you believe there was, have you any means of knowing whether the fact was so or not?

A. To the best of my knowledge there was.

*Mr. Solicitor General.*—That was proved by us yesterday.

*Mr. Pollock.*—There was a communication between the grinding-house and the long sugar-house; do you know whether there was a communication between the long sugar-house and the new sugar-house? *A.* I really do not know.

*Mr. Scarlett.*—Allow us to examine the witness.

*Mr. Solicitor General.*—He says he got the information from Mr. Lockie.

*Mr. Serjeant Lens.*—He says he does not know, and you have no right to ask his conjecture.

*Mr. Pollock.*—You say you do not know whether it was so; have you learned from any of the plaintiffs whether it was so? *A.* I have not.

*Q.* Was there any communication between the new sugar-house and the grinding-house?

*A.* I don't know that myself; I have not seen them; I was not at that part of the premises previous to the fire.

*Lord Chief Justice Dallas.*—Why do not you call the Surveyor?

*Mr. Pollock.*—Is Mr. Lockie here? *A.* I believe he is.

**Mr. JOHN LOCKIE, Sworn.**

*Examined by Mr. SCARLETT.*

*Q.* Are you a Surveyor? *A.* Yes.

*Q.* Were you ever employed by the plaintiffs to make any sketch or drawing of their premises? *A.* I was.

*Q.* When were you first employed by them for that purpose?

*A.* Sometime in the last year; I do not recollect when; I had been employed by them before.

*Q.* Professionally? *A.* Yes.

*Q.* Can you tell us, from any knowledge you have of your own, when they first built what is called the new sugar-house?

*A.* I cannot tell exactly.

*Q.* You can tell the year?

*A.* I think it has been built about a year, but I am not certain.

*Q.* Are you sure it was built before the month of October, 1819? *A.* Yes.

*Q.* Have you seen it? *A.* Yes.

*Q.* We understand that the lower part of these sugar-houses, all three of them, were devoted to the manufacture, and the upper part the warehouses?

*A.* There are two; the grinding-house was not a sugar-house, there was no pan in it.

*Q.* What was there in the grinding-house?

*A.* There was a stove; perhaps there were two; in fact there were two stoves, but one I considered as belonging to the long-house; they estimated it as such.



Q. Was there any communication between the grinding-house and the long-house? A. There was.

Q. By doors? A. Yes.

Q. Iron doors, I believe? A. Iron doors.

Q. Was there any communication by doors between the grinding-house and the new house? A. There was.

Q. Were those doors upon the several successive stories?

A. They were.

Q. As represented upon this model? A. Yes.

Q. Were there also iron doors that communicated between the long-house and the new house? A. There were.

Q. Where do these iron pins go?

A. They are to represent the iron tubes from the boiler.

Q. The communication that you have mentioned is upon the different stories?

A. Yes; as they are there represented.

*■ Cross-examined by Mr. SERJEANT LENS.*

Q. You had occasion to view these premises, being employed, some time before, by the plaintiffs, to make a perspective view of them? A. Yes.

Q. I understand you are the regular Surveyor of the Phoenix Insurance Company, pray had you occasion to see them on behalf of the Phoenix Office? A. Yes.

Q. You went there to examine them for the Phoenix?

A. Yes.

Q. And particularly to examine the works that were carried on there? A. At a distant period from the fire.

Q. While these new works were carrying on?

A. No: I was never sent by the Phoenix Company for that purpose, nor did I ever see it.

Q. My question was, whether, besides this occasion, when you say you were employed by the plaintiffs, you have not had occasion to see the premises on behalf of the Phoenix?

A. At a very distant period from the fire, not for at least twelve months.

Q. Twelve months before the fire you had occasion to go on these premises?

A. Not within the last twelve months, but within twelve months before the fire I have not been sent by the office.

Q. Had you been there at all, for the purpose of inspecting the premises at any time before the fire; I understood you to say, about a year before you had been on the premises?

A. It is more than a year.

Q. On whose account—was that for the Phoenix Company?

A. I do not know how much more it was than a year.

Q. It was more than a year? A. Yes.

Q. Did you see this work which was carried on?

A. I did not.

Q. Was there any alteration projected at that time, and communicated to you as a projected alteration?

A. The last survey I made for the Phoenix Company, perhaps there might be some alteration projected.

Q. Was it not communicated to you, that there was such an alteration in contemplation?

A. There was some communication passed between Mr. Bishop and myself respecting it.

Mr. Scarlett.—I do not object to it, but it is not legal evidence in this cause?

Mr. Serjeant Lens.—Either object or not. There was a communication made to you upon the subject? A. Yes.

Q. When the communication was made to you, did you not entertain an opinion, that there was no additional risk; and no hazard likely to be incurred, by that which was projected? A. I did not.

Q. Did not you point out, after these alterations had been communicated to you, that the best spot to carry it into effect would be the long-house? A. I did not.

Q. Was not your opinion asked on the subject; and you said you thought the best place for doing it was the old house?

A. I will relate what did pass, and point out the place, and then I will answer any questions you may choose to put. Having been employed by Messrs. Severn and King, in my private capacity, I was upon these premises very frequently, without any connexion with making surveys for the *Phoenix Company*. When I am sent by the Company to make a survey for them, I make a survey for them, and report to them, but in my private capacity I do not mix the two things together. I was very frequently upon the premises, and sometime in the summer, I do not recollect the exact period, I was there, and saw Mr. Bishop, and Mr. Bishop took me to a door, not shewn on this model, in this building, which is now standing: these buildings that have roofs upon them are safe; those that have not are destroyed by the fire; this house was called the scum-house, and Mr. Bishop spoke to me, as follows. "I have something to say to you, which must be between ourselves, Mr. Lockie: I want to make an improvement here, I want to make some alteration, or put something up (I do not recollect the very phrase) for a new process; and he took me up stairs, to one of the upper floors in this house, and said he wanted to put up a boiler, and asked me my opinion, if I thought it would stand here;

"I do not recollect the floor, and the space was measured out; he said it was nine feet long, the space was measured out, and I said there would be a difficulty in making a safe ash-pit; what passed more I do not remember, but truth demands that I should say, that I did understand, before I left the premises, that that boiler was for oil."

Q. Coming at last to that, did you form any opinion and express any opinion, that that might be safely and properly done?

*Mr. Scarlett.*—I object to that.

*Mr. Serjeant Lens.*—This is entirely a question of opinion.

A. I formed no opinion with respect to risk, I did not believe that the Phoenix then had an insurance on these premises;—I could exercise no opinion with reference to insurance.

Q. Did you form any opinion?

A. I did not with regard to security from fire, farther than that a brick trimmer would be necessary.

Q. Did you exercise any opinion, to any extent, upon the subject of the risk of the boiler?

A. Not at the time, further than that there should be a brick trimmer under it, and that I should have judged it necessary, if it had been a boiler for boiling water.

A. But you afterwards learned, on the premises, that it was intended for oil?

A. Yes.

Q. Would there be any difference, do you think, between them; would it lead you to a different judgment, if you found it was for oil?

A. It was perfectly indifferent; I did not consider the thing at all.

Q. Having recommended the boiler to be put up, when you found it was to introduce oil, you did not think it necessary to make an alteration in your opinion?

A. I did not form any opinion upon it, it was a question of perfect indifference to me; it was mere curiosity with respect to it.

*Lord Chief Justice Dallas.*—If you had been employed by the Company, would you have thought it your duty to communicate to them the projection of this boiler for oil?

A. I must have done so. I will state the course I should, perhaps, have taken, and though I cannot divest myself of all the circumstances that have taken place since the fire, yet I will state to your Lordship the course I have adopted in other cases: —

*Lord Chief Justice Dallas.*—I do not think it necessary.

*Mr. Serjeant Lens.*—His opinion of what he should have thought it right to communicate, is not evidence.

A. I should, most likely, have taken a committee to see it.

*Lord Chief Justice Dallas.*—You have asked him to what took place between the plaintiffs and himself, and I now ask whether, if he had been employed by them, he would have given them an opportunity of exercising their judgment on the process?

*Mr. Serjeant Lens.*—You went over these premises in September, 1818, for the Phoenix Company, and the new house and all the premises?

A. I do not remember it, but the office book will shew it.

Q. Do not you recollect, in the month of September, 1818, having occasion to go over all these premises, and did you, in consequence, make a report about the state of the premises?

A. I have no recollection of it.

Q. Did not you, in point of fact, in September, 1818, go over these premises and make a report?

A. I have no recollection whatever of having been sent by the Phoenix Company, to make the survey you mention.

Q. Have you any recollection of the fact, whether you had, or had not, made such a survey?

A. I make such a distinction, because it is important for the truth; I have been on the premises fifty times, but not more than two or three times for the Company.

Q. Did you, in September, 1818, go upon these premises, and examine the state in which they were?

A. It is very likely that I might, but I do not recollect the period.

*Mr. Scarlett.*—We are not trying the Phoenix Company.

*Mr. Serjeant Lens.*—Your memory does not enable you to state, whether you did, or not, in September, 1818, go upon these premises, have a complete inspection of them, and see them as they then existed?

A. My memory does not serve me.

Q. That might have happened?

A. It might. I have so many surveys, it is impossible I can recollect the dates. I record my reports in the office book, and there is the date to them, and I have done with recollecting dates.

*Re-examined by Mr. SCARLETT.*

Q. I observe you say, in the communication Mr. Bishop made to you before he set up this process, he said it must be a matter between ourselves? A. Yes.

Q. Were you consulted by him for his convenience and information, or with reference to any office?

A. I decidedly thought I was consulted by him for his own

benefit, and not by any office. I promised not to reveal it to any person?

Q. Reveal what?

A. What he had told me respecting the oil.

Q. Did he exact that promise from you?

A. In the commencement he said, it must be between ourselves.

Q. Have you seen Mr. Bishop since this accident, and conversed with him upon the very same subject? A. I have.

Q. What has he said upon it?

A. On the morning that the fire happened, I saw Mr. Bishop on the premises, and I said to him these words, to the best of my recollection, "Mr. Bishop, I am very sorry to see this, but I am glad to see this warehouse standing."

Q. Is that the warehouse in which you supposed he would put the boiler?

A. I will tell you what passed: "Why that," said he, "Mr. Lockie?"—"because there you have been trying your new experiments; have you not?"—"No," says he, "to be sure we have not; it was in the long-house, and there it is now."

Q. The communication which he said must be between yourselves, was respecting the project for putting the oil boiler in the scum-house? A. Yes.

Q. Which has not been touched? A. No.

Q. Had you, at that time, any reason to know it was not in the scum-house?

A. I had no recollection of any thing, and the conversation I have related, shews I contemplated it to be there.

Q. Did any thing pass at that time, between you and him, respecting your being told to keep it a secret?

A. Yes, I told him it should not be known to any person from me; and he replied, "that I am sure of, Mr. Lockie."

Q. Do you remember asking Mr. Bishop respecting his other partners?

*Mr. Serjeant Lens.*—How is this evidence?

*Mr. Scarlett.*—I have a right to examine to the conversation with Mr. Bishop. In that conversation with Mr. Bishop, in which you were desired to keep it secret, did any thing pass between you and him respecting the knowledge of his other partners?

A. Not in the first conversation there was after the fire. I asked Mr. Bishop if he had kept it a secret from his other partners, as well as from the offices; he said, "No, Mr. Lockie, they knew every thing I was doing as well as I did myself."

Q. My learned friend has asked you about your forming any judgment of the danger from the oil; did it at that time

enter into your consideration to form any judgment on the subject?

*Lord Chief Justice Dallas.*—He says not.

*Mr. Scarlett.*—Have you made many surveys of sugar-houses? A. At that time I had not made any survey.

Q. Had you been aware of instances of fires in sugar-houses before?

A. I suppose there are more fire bills pass through my hands than through any other individuals.

*Mr. Scarlett.*—I want to ask, whether any fires happen from sugar boiling over?

*Lord Chief Justice Dallas.*—An experienced man told you yesterday he had heard of many fires in sugar-houses, and never could ascertain the cause of them; it requires no great sagacity to discover why there was a reluctance to calling this gentleman first——

*Mr. Scarlett.*—I felt a reluctance, and forbore to ask him that question.

There was a good deal passed in confidence which he was unwilling to disclose.

*Mr. Scarlett.*—It was my opinion he ought to have been called on the other side.

*A Juryman.*—Are you quite sure as to the words you say, “I asked Mr. Bishop if he had kept it a secret from his partners, as well as the offices?” Are you quite sure as to those words “as well as the offices?”

A. I am quite sure of them.

Q. What induced you to say that?

A. I was afraid Mr. Bishop had been trying this experiment entirely from his own desire of experiment, and that he might get into blame with his partners.

Q. Did any conversation pass between you about his not having communicated it to the insurance offices?

A. Never: the insurance was not in his department.

Q. Then how did you know he had kept it secret from the office?

A. I concluded it was kept a secret from the office by his desiring me to be secret.

Q. Was his object in keeping it secret to prevent the insurance offices from knowing of its introduction, or because he wished to keep the process from the directors of the office who were concerned in the same trade?

A. With a view to keep the process entirely to himself; and I conceived it was done with a view to keep it secret from the Phoenix, because there are many sugar-refiners in it.

Q. With a view to keep the process secret, that the plaintiffs might have the benefit of it exclusively?

A. Yes, I believe the risk never entered into their contemplation.

**WILLIAM CHRISTOPHER, Sworn.**

*Examined by Mr. Serjeant BLOSSETT.*

Q. You are in the employ of Messrs. Craven and Bowmans? A. Yes.

Q. You are a bricklayer, I believe? A. Yes.

Q. Do you remember Mr. Wilson setting up a boiler at Messrs. Craven and Bowmans? A. Yes.

Q. When was that? A. It was in September, 1818.

Q. It was set up under Mr. Wilson's direction?

A. Yes, I set it up myself under Mr. Wilson's direction.

Q. Did he tell you how it was to be fixed? A. Yes.

Q. Were you present when Mr. Wilson attended to its working? A. The whole of the time.

Q. How many times was it used altogether?

A. Twelve or thirteen times.

Q. In all it was not used more than twelve or thirteen times?

A. I do not think it was, I did not keep an account.

Q. Where was it put?

A. In a place called the magazine.

Q. Is that a detached building?

A. It is a building that lies useless, adjoining the coach-house.

Q. How near is it to the sugar-houses?

A. I believe the opening between them is about thirty feet.

Q. What is there between that place and the sugar-houses?

A. There is a dwelling-house at one end; next Mr. Fry's sugar-house there is a passage, and about ten feet roadway.

Q. During the twelve or thirteen times this machine was used, was Mr. Wilson there? A. Yes.

Q. Was it ever used when he was not there? A. No.

Q. Did he give directions as to the precise degree of heat to be used? A. Yes.

Q. Was the oil ever heated at all before he came.

A. Twice up to 210°.

Q. Did he leave word it was to be heated up to 210°?

A. Yes.

Q. Was that the precise degree of heat he fixed himself?

A. Yes; when he was not there.

Q. And that happened only twice?

A. Yes; then he left orders with me.

Q. At all other times did he see the oil heated from the beginning? A. Yes.

Q. Twice he suffered the oil to be heated up to 210° before he came? A. Yes.

Q. When he came, to what degree of heat did he raise it himself?

A. Between three and four hundred; and then he used to tell the men to work the pump two or three strokes, to return the cold oil into the boiler, and let the warm out, so that the heat would go down.

Q. What was the effect of that with respect to the heat?

A. He stoked the fire himself, to get the oil up to near 400°, then he would tell the man to go on pumping, and they pumped for twenty-eight minutes, and the skipping was done.

Q. What is the skipping?

A. The quantity of sugar put at one time into the pan: the oil would get up from 400 to 450°, while the pan was discharging.

Q. Can you tell us at all, during what time the heat rose to 450°, upon the stoppage of the pump?

A. It did not rise the first three skipplings, they used it nine times in a day.

Q. What do you mean by that?

A. Three skipplings are one filling: the last time it was heated the oil became hotter, and was 500°.

Q. Upon what occasion was that?

A. By the pump being stopped.

Q. That was at the latter part of the day? A. Yes.

Q. But at first it rose to 450° on the stoppage of the pump?

A. Yes.

Q. Was the fire increased at all upon those occasions?

A. Directly the pump stopped, the door was thrown open, and the fire damped.

Q. But still it rose? A. Yes.

Q. Do you remember the effect upon the apparatus, on the fire rising to this degree?

A. Yes; directly the sugar was put into the pan at this great heat, it broke the pipes.

Q. What sort of pipes? A. Pewter with soft solder.

Q. Did the solder suffer from the heat?

A. I cannot tell; the pipes broke, and the oil mixed with the sugar?

Q. Do you remember, upon any occasion, the oil rising to a still greater degree of heat? A. Yes, I do.

Q. What was the utmost degree?



A. One day, towards the finish, two gentlemen came with Mr. Wilson, and the men were pumping at 410°.

Q. The oil was at 410°; the men were pumping, and two gentlemen came with Mr. Wilson?

A. Yes; and while the pan was discharging and charging again, the oil got to 500°; then, directly the pan was charged——

Q. During the time it rose to 400°, was the pump stopped?

A. Yes.

Q. How long had the pump been stopped?

A. It might be five or six minutes while the pan was discharging and re-charging.

Q. The men were pumping at a heat of about 410°?

A. Yes.

Q. But on stopping for five minutes, it rose to 500 degrees?

A. Yes.

Q. Upon its rising to that heat, what occurred then?

A. The pipe broke, Mr. Wilson shut the door, and said, go on; the men began pumping, and the pipe broke, and the oil mixed with the sugar again?

Q. What occurred?

A. Mr. Wilson and the gentlemen then went away; he said they began pumping before the pipes were covered with the sugar.

Q. Did he see the state of the pipe and the pan before he told them to begin to pump?

A. Yes, he stoked the fire himself.

Q. Had he an opportunity of seeing what was done?

A. Yes, and he told the men to go on.

Q. And then this happened?

A. Yes, and the men stopped immediately. Mr. Wilson raked the fire out.

Q. Upon Mr. Wilson seeing all this occur, he went and raked the fire out? A. Yes.

Q. What occurred then, did the heat increase or diminish?

A. It increased to very near 600°, Mr. Wilson raked the fire out, and I threw two pails of water on the bars.

Q. Did the blaze of the fire increase while Mr. Wilson was raking the fire out?

A. It went through the ashes.

Q. How do you account for the increase of the heat, on the fire being raked out?

A. The oil got heated in consequence of the pump not working.

Q. What took place then?

A. Mr. Wilson and the gentleman went away, and we

went to the door, we found the oil kept bubbling, and making a great noise, and we retired to the door. I saw the oil come through the nails at the top of the boiler, and from underneath, not distinctly to see it drop.

Q. Do you mean by the nails, the rivets?

A. Yes, where the boiler is put together.

Q. Was it ever worked again after that?

A. Yes, I believe once, I pointed out to Mr. Wilson where the worst was, and it was used once or twice after that: but the oil was never got to such a great heat afterwards.

Q. And since that time it has not been worked at all?

A. No.

*Foreman of the Jury.*—Was there a steam pipe to that boiler?

A. There was a vent to carry the steam from the sugar: but when he put the boiler up first, it was without a pipe to carry the vapour away, the smell offended the neighbours, and he carried it into a tube, and from that he carried a  $\frac{3}{4}$  pipe to the chimney to take the smell away.

*Cross-examined by Mr. Serjeant VAUGHAN.*

Q. At first you had no vent for the steam at all? A. No.

Q. This was the time Mr. Wilson was making experiments upon it? A. Yes.

Q. And you had pewter pipes instead of copper ones?

A. Yes.

Q. And pewter will not bear the heat that copper will?

A. Mr. Wilson preferred copper.

Q. Though you got it so high as 600° and above, you never set your premises on fire with it? A. No.

Q. And you threw pails of water on it?

A. On the bars, to keep them cold; there was no signs of fire at all.

Q. You got it to above 600°. A. Yes.

Q. Had you a thermometer in the oil, and did you examine it?

A. Yes, it was placed in the front part, just over where the fire beats against, four inches from the centre of the boiler, towards the side.

Q. Those were experiments he was making to see how the thing would answer at that time? A. Yes.

Q. And no mischief happened in the way of fire?

A. No.

Q. How high was the thermometer graduated?

A. 600° was the highest number, and the thermometer stood at that, it finished at the top, which was 600°.

*A Juryman.*—Did not your thermometer break?

A. Once it did, and we were troubled for two days to get another.

*Mr. Serjeant Vaughan.*—You could not make a fire of it all you could do? A. No.

Q. Did the thermometer break in the boiler, or not?

A. I do not know whether it was broken by accident or how, I believe it was done by accident; but I cannot say how it was broken.

*A Juryman.*—Was the thermometer broken at the time you had this great heat? A. No, it was whole.

Q. Then the thermometer rose to the greatest heat?

A. Within one or two degrees.

Q. Did it go down again? A. Yes.

*Re-examined by Mr. Serjeant Blossett.*

Q. At this time there was a pipe fixed in the boiler to carry away the vapour? A. Yes.

Q. At first there was not, you say? A. No.

Q. How soon after the experiment first began, was it that the pipe was put?

A. I will not be sure whether it was the first or second time; but after the first time it was so offensive it was impossible for the men to work, and it was  $2\frac{1}{2}$  inch diameter pipe, which took it to the tub of water, and from that it went up the chimney.

Q. That was done early in the course of the experiments?

A. Yes.

*Mr. Serjeant Vaughan.*—Do you know the size of the fire on these premises? A. No.

Q. It was a larger fire than you used in proportion?

A. Yes, our boiler was twelve feet long, and the fire-place two feet six inches square.

Q. Was your fire larger than Messrs. Severn's?

A. It was a great deal larger.

*A Juryman.*—Do you know how many gallons of oil were in the boiler? A. Eighty gallons.

*Mr. Serjeant Blossett.*—The boiler you used was larger than that boiler? (*pointing to the model*).

A. Yes, I think it was according to the pattern of this.

Q. But the quantity of oil was eighty gallons?

A. Yes, that was what he put in first.

Q. Did you put in the same quantity of oil afterwards?

A. No: there were nine gallons, or something more consumed, it was wasted and consumed, and some mixed with the sugar, and then we put in about nine gallons to supply it.

Q. What time of day did these boilings take place?

A. Sometimes at nine o'clock, and when he gave the orders and could not attend till ten, I lit the fire.

Q. Till what time in the afternoon were they continued?

A. About two in the afternoon.

**SAMUEL WILKINSON, Sworn.**

*Examined by Mr. POLLOCK.*

Q. Are you foreman to Messrs. Taylor and Martineau, chemists and engineers? A. Yes, I am in that capacity.

Q. What are they? A. Chemists and engineers.

Q. Were you directed by them, in the month of February last, to take charge of any oil vessel?

A. On the 15th of February last, I received orders from Mr. John Taylor, to make experiments on oil.

Q. When did you begin the experiments?

A. Mr. Martineau, one of the partners in the firm, wished to try a boiler, as nearly as possible representing that boiler, I believe.

Q. In point of fact, when did you begin?

A. Mr. Martineau tried this boiler with a small quantity of common whale oil.

Q. On what day?

A. It was on the Saturday afternoon Mr. Martineau tried this, which was the 13th of February.

Q. Were you present? A. Yes, I was.

Q. On the 15th you began the experiments, what was the quantity?

A. On the 15th, Mr. John Taylor came from his house to the manufactory in White-cross-street; I received orders to add a quantity of oil to the oil Mr. Martineau had boiled on the Saturday afternoon. I added a large quantity, I suppose about two thirds more than had been in the vessel and boiled.

Q. What quantity was there in the whole?

A. Varying between twenty and thirty gallons.

Q. Will you describe the vessel, what sort of a vessel was it?

A. Excepting a dome top, the vessel was as nearly like that as possible, there was a pipe at top to convey any vapour that might arise, it was suggested there would be some arise.

Q. Have you got the dimensions of the vessel? A. Yes.

Q. State how long, and wide, and deep it was?

A. It was three feet long, fifteen inches wide, and fifteen inches deep; made of wrought iron.

Q. Was it made of wrought iron united by rivets?

A. Yes, it was.

**Q.** Did you continue your observations upon this for any length of time?

**A.** Not upon this experiment, only for one day, or some few hours in the course of that day; it was to endeavour to know, for Mr. Taylor wished to know, whether a certain quantity of common oil, mixed with that oil which had been boiled, would produce inflammable vapour at a low temperature.

**Q.** This was on the 15th?

**A.** On the 13th, at fifteen minutes past eight in the morning precisely.

**Q.** What was the result of that?

**A.** Mr. John Taylor was present when the fire was put under it, the thermometer had to go a long way through the boiler; we could not ascertain the temperature till we came to about 100°, and from 100° to 280°, there was a vapour arising, with a good deal of noise, in the boiler.

**Q.** What was the result of that one experiment?

**A.** In the presence of Mr. Taylor, and I believe Mr. Taylor himself applied a light at the top of the tube, the vapour did not appear inflammable, and there was no appearance of flame with a light applied until we came to a temperature of 280 degrees

**Q.** A minute or two ago, when you spoke of some thing and 180° did you mean 180° or 280°?

**A.** I said from 100° to 280°.

**Q.** Was that what has been said, called permanently inflammable?

**A.** I do not know such a thing, the vapour at 280° took fire in sudden gusts, as an explosion, the vapour did not continue on the top of the tube, but in sudden gusts; as the explosion took place in the boiler, the flame issued by the application of a light.

**Q.** What do you mean by an explosion in the boiler?

**A.** In making a fire under this oil, I found, when it came to a temperature between 280° and 300°, there was a noise like fat frying in the boiler, and when the vapour that was inflammable issued from this tube, there was a sudden concussion in the boiler, which I call an explosion.

*Lord Chief Justice Dallas.*—When the fire was applied to the tube what happened?

**A.** As this concussion took place in the boiler, so the vapour spread itself in flame, in proportion as it was inflammable, and went out immediately.

*Mr. Pollock.*—Holding the candle as you did occasionally, there were these appearances?

**A.** It went off like lightning, as much as ever I saw any thing.

Q. Was that the whole result of the experiment?

A. Mr. John Taylor proved the thermometer by boiling water, and it was secured to prevent its falling into the oil, when the temperature was at 280°, and from that to 340°. The thermometer was broken by me in taking the man-hole door from the boiler. I endeavoured to keep the bulb of the thermometer where the mercury was gone, to see whether it was broken by the oil or not, I found that was broken, which could not have been occasioned by my hand.

Q. How high was the thermometer graduated?

A. I do not recollect, but it was above 700°. I believe as high as 900°; if I mistake not, it had an open top to it.

Q. That is the result of the first experiment? A. Yes.

Q. Did you commence another experiment, which you continued for many days?

A. After the thermometer had broken, Mr. John Taylor thought it would not be a fair experiment with that oil: I then received orders to empty the boiler, and well clean it out, as Mr. John Taylor saw there was a strong probability of the vapour coming from that; he washed the boiler perfectly clean, and I put in about 33 gallons of whale oil.

*Lord Chief Justice Dallas.*—New, or old? A. New.

*Mr. Pollock.*—When did this second experiment commence?

A. On the 16th of February.

Q. You say you cleared out the boiler and put in 33 gallons of fresh oil, and then you began?

A. Yes, about that quantity.

Q. How many days did you continue the experiment?

A. Twelve days, I believe.

Q. How many hours each day was it heated, or did that vary?

A. The fire was generally made at six o'clock, or a little after—between six and seven, and it went about eleven hours a day.

Q. It was heated about eleven hours each day? A. Yes.

Q. Was it suffered to cool during the night? A. Always.

Q. What was the highest degree to which the oil was carried during this experiment, on any one occasion?

A. Five hundred and seven degrees; to my knowledge it never was above that, it was kept for some days below 400°.

Q. But it never on any occasion exceeded 507°? A. No.

Q. Now will you state the progress of your observations upon the oil from day to day, and when you observed it to be inflammable, and what results took place?

A. It probably would be tedious to mention all my remarks.

Q. On the first day, what was the highest degree of heat to which you carried it?

A. Three hundred and eighty degrees.

Q. Did any inflammable vapour come from it during that day?

A. I did not observe any; I tried it several times.

Mr. Scarlett.—Was there a tube over it? A. Yes.

Mr. Pollock.—What was the height of that tube?

A. I am not prepared to say what it was then exactly—I should suppose it was about four feet.

Q. On the second day, what was the highest degree of heat to which you carried it?

A. Three hundred and seventy-five degrees.

Q. Did you, on that day, observe any inflammable vapour?

A. The vapour was slightly inflammable at  $375^{\circ}$ , as it was before at  $280^{\circ}$ , in the other oil.

Q. On the third day, how high did you carry the experiment? A. Three hundred and ninety-five degrees.

Q. Did you find it inflammable then?

A. Not at all.

Q. On the fourth day, how high was the temperature?

A. Three hundred and eighty degrees. The lowest temperature that it was inflammable that day, was  $358^{\circ}$ .

Q. Are you speaking of the fourth day? A. Yes.

Q. The fourth day, the lowest temperature at which it was inflammable, was how much?

A. Three hundred and fifty-eight degrees; and it was more inflammable at that than it was on former occasions.

Q. On applying a light to it, it burned?

A. At  $360^{\circ}$ , by applying a light to it, it burned, and lasted for some minutes on the top of the tube.

Q. Was it on the fourth day, or when was it, you made any observations as to any effect in raising the fire briskly or slowly? A. On the fourth day.

Q. Then did you remark a difference between raising the fire gradually and briskly?

A. Yes, I tried the experiment.

Q. State the result?

A. It continued, with the same oil as yesterday, at  $358^{\circ}$ ; the vapour very inflammable when it was  $360^{\circ}$ ; the vapour took fire by applying a light, and it *lasted some moments*, and at  $380^{\circ}$  the vapour was scarcely inflammable.

Q. Did you repeat that more than once?

A. No: but during that experiment I made no remark upon it. I believe I did repeat it.

Q. On the fifth day, what was the highest temperature?

A. Three hundred and sixty-five degrees?

Q. Was it then inflammable, or not?

A. The vapour was inflammable at 345°, 350°, and 365°; it continued to be inflammable from 345° up to 365°.

Q. Did you carry it beyond 365°? A. No.

Q. On the sixth day?

A. Vapours strongly inflammable at 345°, that is stronger than it was yesterday, or the day before, at 360°. I applied a light to the vapour in the boiler, in the presence of Mr. Ferraday, which took fire, and lasted some *moments*, in the boiler. I unscrewed the tube, and applied a light to the hole in the boiler, and it burnt in the boiler.

*Lord Chief Justice Dallas.*—The vapour burnt?

A. The vapour burnt in the boiler.

*Mr. Pollock.*—Did you state the highest degree to which you carried it on the sixth day?

A. Three hundred and sixty degrees is the highest temperature, I believe.

Q. On the seventh day, just state the highest degree to which you carried it at all, and the lowest degree at which you found it inflammable?

A. It was suggested by Mr. Taylor and others, that it was proper to take twelve gallons out of the boiler, which was done.

Q. What was that done for?

A. It was deemed not a fair experiment, when compared with this boiler; the oil was deeper in our boiler than in that boiler.

Q. Therefore, to assimilate it to that boiler, you took twelve gallons out? A. Yes

Q. When was that? A. On the sixth day.

Q. State, on the seventh day, the highest degree to which you carried it, and the lowest degree at which it was inflammable? A. At 345° it was slightly inflammable.

Q. And what was the highest temperature to which you carried it? A. Three hundred and ninety degrees.

Q. Is that lower than you had observed it before to be inflammable? A. I believe it is.

*Lord Chief Justice Dallas.*—What was it at 390°?

A. At 390° it was inflammable; no material difference was made.

*Mr. Pollock.*—Was there any material difference between the oil at 390° and 335° on the seventh day?

A. When I received orders to take twelve gallons out of the boiler, I received orders likewise to raise the temperature that day; I was limited to a certain temperature; before it was never to exceed 400°; I then received orders from Mr. John Taylor to carry it to 500° by the thermometer.



**Q.** On the seventh day, did you observe any difference between the degree of inflammation when it was at 335° and 390°?

**A.** I made no difference in my journal; and I do not recollect that there was any difference.

**Q.** Did you inflame it at 390°? **A.** Yes.

**Q.** On the eighth day, how high did you carry it?

**A.** To 500°.

**Q.** Did you make any observation upon it at that high temperature?

**A.** At 360° it was inflammable; when it was at the highest, I took a rule and measured seven inches and a half from the top of the tube, and it burnt like lightning, and spread about; I put the rule close to the tube, and at the end I applied a light, and the vapour spread itself, and took fire very widely, without any noise relative to the explosion; the explosion in the boiler was still the same.

*A Juryman.*—Was it a continued stream of fire?

**A.** As long as the vapour continued.

**Q.** Were you obliged to hold a light to it?

**A.** Yes, at intermediate times, when this concussion did not take place in the boiler, there was no vapour or flame, it was only fire occasionally, as the vapour came from the tube.

*Lord Chief Justice Dallas.*—Did you every apply the flame to the vapour without finding it inflammable?

**A.** Yes, at certain temperatures.

*Mr. Pollock.*—State at what temperatures?

**A.** I have at very high temperatures observed the vapour not inflammable; but that is because we were not raising it with a sharp fire. I could see no other reason, because it was always inflammable when there was a sharp fire.

**A.** Is that the conclusion you came to? **A.** Yes.

**Q.** When it was raised by a sharp fire, it was inflammable at a lower temperature? **A.** Yes.

**Q.** On the 9th day what did you observe?

**A.** The vapour was slightly inflammable at 360°; at 497° the vapour took fire at the end of the worm; there was a worm attached to this boiler by another pipe, beside the pipe that was to take the vapour off; the pipe stood up some distance, and led off by an union screw, soldered into a lead pipe; this was fifteen feet long, passed through a cask of water, and at the end of this it took fire at 497°.

**Q.** What is a worm tube?

**A.** For the purpose of condensing water.

*Mr. Pollock.*—The pipe goes from the boiler in a spiral tube, which is in a tub of water? **A.** Yes.

Q. That is the worm tube? A. Yes.

Q. To condense any vapour capable of being condensed?

A. Yes.

Q. At the end of the worm what did you observe?

A. At 497° the vapour took fire at the end of the worm, and continued burning without once going out twenty minutes, and burnt six inches in length.

Q. Did you observe during that day, whether what came from the boiler was inflammable at 400°?

A. I did not at 400°; at 360° I did. It was inflammable at 360°.

Q. On the 10th day?

A. On the 9th day, I tried to what number of degrees I could raise it in a certain time with a middling fire, it rose 143° in fifteen minutes, the fire-place was twenty inches long, ten inches wide, and ten inches deep, between the bottom of the boiler and the bottom of the bars.

Q. What state had it been at before?

A. I do not recollect exactly what it was; I do not know at what temperature it stood. It was above 300°, I have no doubt, for we generally kept it to 300°.

Q. That was during the course of the day, not the first thing in the morning? A. It was in the course of the day.

Q. Therefore you conclude it was above 300° when you began, and you raised it 143° in fifteen minutes? A. Yes.

Q. On the 10th day, did you observe at what temperature (the lowest), it was inflammable?

A. At 345°; at 390°, by applying the light of a taper, it took fire, and spread itself like lightning.

Q. In the course of that day, did you find it inflammable at a lower temperature than 345°?

A. No: I do not recollect, but at 360° it appeared to be as inflammable as it was at 500° in that day.

Q. Then on the 10th day, you found that, at 360°, it was as inflammable as on former days it had been at 500°?

A. It was so the same day.

Q. On the 11th day what did you observe?

A. In raising the temperature, the first thing in the morning, I found it slightly inflammable at 310°.

Q. That was the lowest degree at which you found it inflammable?

A. Yes, I never found it lower than that in the course of the experiments.

Q. What was the highest temperature you took it to that day?

A. It did not exceed 500° I daresay, but I have not noted it.

Q. Did you make any experiment at 500°?

A. Nothing particular; I only state here, as it increased in temperature, so it increased in inflammability.

Q. On the 12th day, how low was it inflammable?

A. Three hundred and ten degrees.

Q. Was it slightly inflammable?

A. Slightly so; I am not aware of any difference between that day and the day before.

Q. Did you make any experiment at the end of the worm on that day?

A. I do not recollect that I did.

Q. I believe, afterwards, another experiment was made for a longer time? A. It was.

Q. Did you at all assist in watching or conducting that experiment?

A. It was under my directions, and I received directions from Mr. John Taylor; I saw it put in execution by his orders; there was a person employed to keep it at a temperature of 360°.

Q. What is the name of that man? A. Smith.

Q. Did you attend to it from time to time, yourself?

*Lord Chief Justice Dallas.*—Give the date of it.

*Mr. Pollock.*—When did that begin? A. On March 8th.

Q. How many days did it continue? A. Twenty-three.

Q. As far as you were concerned, did it ever exceed, during that time, a temperature of 360°?

A. Once, I think, the thermometer was graduated in five degrees, and it was about 363°; it did not exceed 365°.

Q. What vessel did you use on this second occasion?

A. The same vessel properly cleaned out.

Q. What oil was put into it?

A. Whale oil was sent for, for the purpose.

A. Was it fresh? A. It was from the manufactory.

Q. It had not been used?

A. No: it was a cask that we got for the purpose.

Q. How many gallons? A. Twenty-four gallons.

*Mr. Scarlett.*—How many hours a-day?

A. Twelve hours; from six in the morning till six in the evening.

Q. Was it upon that oil that the gentlemen met afterwards to make experiments? A. Yes.

*Cross-examined by Mr. Serjeant TADDY.*

Q. You said you were foreman to Messrs. Taylor and Martineau?

A. I have acted in that capacity for some time.

Q. Are they patentees of any thing?

A. Yes, of a steam apparatus, and for generating gas from oil.

Q. Steam apparatus for the same purpose?

A. Yes, to boil sugar.

Q. When were your notes made, at the time? A. Yes.

Q. By yourself? A. Yes.

Q. The first experiment you mentioned, you only observed for a few hours?

A. We had not an opportunity of observing more; it was given up on account of the thermometer being broken.

Q. You observed it for a few hours; was that your expression? A. Yes.

Q. Did you observe what was the quantity of old oil that was in the boiler, and what was the quantity of new?

A. No.

Q. You made no observation as to the quantity of new oil?

A. Two thirds of new was added to one third of old, I suppose.

Q. It is only your supposition?

A. I should suppose there was more than two thirds new oil added.

Q. How was the fire, was it as nearly as you can judge, continued of the same intensity; was it kept full?

A. We had so bad a draft to the fire-place, we had a great deal to do to get it hot at all, sometimes, in any time.

Q. Sometimes you encreased the heat?

A. I endeavoured to *force* the draft, by *adding to the fire*.

Q. At other times, was the fire kept in nearly the same state?

A. It depended upon the temperature by the thermometer. Sometimes I was obliged to throw water on the fire to damp it; and if I knew I had a quick fire, and I thought there was no probability of keeping it at that temperature, I threw water on, or it would have encreased in temperature, which I did not want.

Q. Was the same oil kept in during these whole twelve days?

A. Yes; only once taking twelve gallons out, there was no addition made.

Q. Did the oil in all other respects remain the same?

A. Precisely the same; there was a man-hole door, the same as that boiler.

Q. Did you observe the diminution of oil?

A. I did not.

Q. How much oil was wasted during those twelve days?

A. I do not know.

Q. I observe, that on the second day, you say the vapour was slightly inflammable at  $375^{\circ}$ ? A. Yes.

Q. And on the third, you said, that at  $395^{\circ}$ , not at all inflammable; can you account for that at all?

A. No, I cannot; it was the case, and that is all I know about it.

Q. You consider that an increase of temperature caused the increase of inflammability?

A. That depends on circumstances. I do not know whether it was not the case that I got it up by a slow fire; I cannot say whether I did, or did not; nor did I think it necessary to make the remark.

Q. You cannot, by any observation you made, account for the fact, that, on the second day, the vapour was slightly inflammable at  $375^{\circ}$ , and on the third day, at  $395^{\circ}$ , it was not at all so? A. It was not.

Q. On the tenth day, you say, that at  $360^{\circ}$  it was as inflammable as at  $500^{\circ}$  on the same day, can you account for that?

A. No; I had an opportunity of making observations upon it, and I observed it.

Q. Increase of temperature did not increase the inflammability?

A. It might have been gained by a sharp fire; I cannot speak to that.

Q. On the fourth day —

*Lord Chief Justice Dallas.*—Were the different days in point of temperature nearly the same, or was the atmosphere more or less charged with vapour on different days?

A. I know that some days it was more inflammable than others.

Q. You did not make use of an hygrometer?

A. I did not.

*Mr. Serjeant Taddy.*—This was the same day, the tenth, that you found it as inflammable at  $360^{\circ}$  as at  $500^{\circ}$ .

A. Yes.

Q. Turn to the fourth, you say the vapour took fire by applying a light, and lasted *some minutes* at  $360^{\circ}$ ?

A. Yes.

Q. Do you call that a permanently elastic gas, or a vapour?

A. It is only a vapour.

Q. Not a gas?

A. I cannot answer that; I cannot say whether it is gas or vapour, it came from the surface of the oil; whether it is vapour or gas I do not know.

Q. Have you sufficient information to inform me whether it is a vapour or a gas? A. I have not.

Q. Would not vapour condense in the tube?

A. I have every reason to believe that it did condense in the tube?

Q. In a leaden tube? A. No, an iron tube.

Q. What was that which passed through the worm vessel?

A. It was lead, which was screwed on by a coupling screw.

Q. When you applied light to that which passed through the worm tub, did you apply it at the end of that which was lead, or that which was iron? A. That which was lead.

Q. The other tube at the top was iron?

A. Yes, wrought iron.

Q. Do you know whether that which is properly called vapour, does condense; and that which is properly called gas, does not?

A. I should suppose that which was pure gas would not condense.

Q. I understood you to say, that this vapour which you saw did condense?

A. It did condense. I do not know that that vapour that I saw condensed, but some vapour in the tube did condense, which I supposed was the inflammable vapour.

Q. There was a condensation of vapour within the tube?

A. At times, but that returned back into the boiler.

Q. How was this fire-place set with respect to your boiler, was it applied to the bottom only, or was it spread round the sides, or how? A. The same as it is in that boiler.

Q. You cannot see the bottom of the boiler? (The oil vessel was entirely enclosed in the model.)

A. I can see how it acts.

Q. Does that fire-place extend the whole length of that boiler? A. I should suppose it did.

Q. Why do you suppose so?

A. Because I do not see any draft, or any thing that is likely to let the smoke away from it any other way; I do not see any thing attached to the boiler to take the smoke away.

Q. Therefore you suppose the draft goes the whole length?

A. Yes.

Q. Was yours the whole length? A. Yes.

Q. Did it come up the sides? A. It did not.

Q. Only extended under the whole of the bottom?

A. Yes.

Q. It was wrought iron, with rivets. A. Yes.

Q. Who supplied you with the thermometer?

A. Mr. Pastorelli.

Q. Was it the same thermometer that was broken, that you had again?

A. No ; that was quite impossible.

Q. Did you receive it from Mr. Pastorelli?

A. Yes, I received it myself; but it was proved before it was put into the oil, by hot water.

Q. Who is Mr. Pastorelli?

A. A man who makes them, he makes clocks and so on.

Q. Has he any shop? A. I believe so.

ALEXANDER SMITH, Sworn.

*Examined by Mr. POLLOCK.*

Q. Were you employed to watch the experiments of some oil boiling? A. I was.

Q. When did you begin?

A. The 8th of March, I believe.

Q. How many days did you continue?

A. Either twenty-three or twenty-four, I will not be positive.

Q. Who assisted you in watching the experiments?

A. A person of the name of Wilkinson.

Q. Wilkinson assisted? A. He superintended me.

Q. How early did you begin to light the fire?

A. At six o'clock in the morning.

Q. How long did you continue during the day?

A. Till six in the evening.

Q. Had you a thermometer? A. Yes.

Q. How high was that graduated?

A. I had orders to carry it no higher than 360°.

Q. Had you a thermometer that would enable you to obey those orders? A. Yes, I had.

Q. How high was it graduated?

A. *I cannot understand.*

Q. How high did it go?

A. I never *took* any notice of it in that respect.

Q. Did it go as high as 400°?

A. Yes, 500° most likely.

Q. What was the highest point you do not know?

A. I *never* looked at *that*.

Q. How high did you keep the oil during the time that you watched it, for twenty-three or twenty-four days?

A. From 45° to 60°, I generally contrived to keep it as nigh as I could to 60°, but sometimes it might be 45°.

Q. What do you mean by 45°?

A. It might drop down in consequence of the fire.

Q. Do you mean 45° or 345°?

A. Three hundred and forty-five degrees and three hundred and fifty, and between that and 60°, I generally all through the piece tried to keep it.

Q. Can you say whether it ever exceeded 365°?

A. No, it once *stole-a-head* of me 363° or 364°.

Q. But you are sure it never got to 365° during the whole time?

A. No.

*Cross-examined by Mr. STEPHEN.*

Q. What is your usual employment?

A. I have been *at sea* most of my lifetime.

Q. Were you ever employed upon a process of this sort before?

A. *Never.*

Q. Do you know what oil was put in this vessel?

A. It was whale oil, but I cannot tell you the name of it.

Q. Do you know where it was got?

A. No.

Q. Where was the thermometer got that you used?

A. I do not know.

Q. When did you attend this, to perceive the heats to which it rose; how many hours a day did you attend it?

A. Twelve hours, I made up the fire immediately after six o'clock.

Q. Were you by it the whole time?

A. I was, even at victuals.

Q. And your attention never off it?

A. No, I could not, I must *keep-a-watch*, or it would have got too far over, or too far under.

Mr. Pollock.—You had nothing to do but watch?

A. Nothing at all.

Mr. MICHAEL FARRADAY,

(Assistant in the Laboratory of the Royal Institution,) Sworn.

*Examined by Mr. SCARLETT.*

Q. Do you assist Mr. Brande?

A. Yes.

Q. You also assisted Sir Humphrey Davy.

A. Yes.

Q. Have you made chemistry your study?

A. Yes, for the last eight years, every experiment of Sir Humphrey Davy was made with me.

Q. Had you any particular knowledge of the substance of whale oil, before you made experiments upon it?

A. Not a particular knowledge.

Q. When did you first begin to make any experiments upon it?

A. May I refer to my notes.

Q. If you please; were your notes taken at the time?

A. These are notes, from notes taken at the time; on February the 9th, was the first note I have taken, I may have made a slight experiment a day or two before that.



Q. Had it, in the course of your chemical enquiries, fallen in your way to enquire the properties of oil in various stages of heat, before this time? A. No, not at all.

Q. Were you at all aware, before you began your experiments, that the oil produces different results, according to the number of times that it has been exposed to fire?

A. I knew nothing of the results; my suspicion was, that different results from what were known would take place.

Q. What was your experiment on the 9th of February?

A. It was on train oil, an experiment to ascertain the temperature at which the oil would burn at the surface, a sort of introductory experiment to any knowledge of oil.

Q. Did you take fresh oil? A. Yes.

Q. What did you find?

A. The oil was heated in an open pan, and was combustible at the surface at  $480^{\circ}$ . I beg your pardon, it is combustible, if confined, at  $480^{\circ}$ , but not when open.

Q. Can you tell us, at what temperature it is combustible, if in an open vessel?

A. Four hundred and ninety degrees.

Q. Explain what you mean, by combustible at the surface?

A. The vapour which arises from the oil is combustible at that temperature.

Q. Does that go off at once, or burn any time?

A. It will burn constantly, the temperature being kept up.

Q. There would be a flame at the top of the oil, as long as you kept it at that temperature? A. Yes.

Q. Did you ascertain that to your conviction? A. Yes.

Q. Did you afterwards try any experiment upon oil that had been formerly exposed to the action of heat? A. Yes.

Q. This oil that Mr. Wilkinson has spoken of?

A. I made an experiment that may not be called for.

Q. Have you ascertained that oil, which has been exposed to heat many successive days, produces a different result, as to combustion, to what it does when fresh? A. Yes.

Q. Tell me, at what point fresh oil boils?

A. I cannot answer that question so correctly as others have; because a good thermometer will boil before the oil will; but it is somewhere about  $600^{\circ}$ .

Q. What is the point at which mercury boils?

A. Rather before the boiling point of oil, about  $600^{\circ}$ . I doubt too much the graduating of thermometers, to swear to the time oil will boil: I do not think thermometers measure high temperature correctly.

Q. When the mercury boils, it ceases to become an index?

A. Yes.

Q. Have you ever distilled oil? A. Yes.

Q. What is the production of that?

A. After the oil is received and condensed again, it is much more inflammable than before.

Q. What is the first substance that rises from it in the progress of distilling?

A. It is the vapour of the oil which condenses again, and which itself seems to contain different substances; the vapour, when condensed, is afterwards capable of being separated into different substances.

Q. Is any one of these substances of an inflammable nature?

A. They are all, except water, more inflammable than oil itself: I have got some of it.

*Lord Chief Justice Dallas.*—The vapour contains all the ingredients? A. Yes.

Q. Does it contain them in the same proportions?

A. No: there are different combinations of the elements produced, which have different properties, I have only brought two of the products.

*Mr. Scarlett.*—What are these?

A. This is naphtha; when purified it has the same specific gravity, and is equally combustible.

Q. Is that some of it purified? A. Yes.

Q. If you were to take off the stopper of that, it would burn immediately?

A. The atmosphere within this phial is combustible, and would take fire immediately.

Q. Even in its cold state?

A. Yes, without any addition of temperature.

Q. Is that one of the products of the oil after distillation?

A. Yes.

Q. That you yourself have produced? A. Yes.

Q. Was it produced by old oil, or fresh oil?

A. By pure train oil.

Q. Have you ascertained that you can produce, from oil that has been repeatedly heated, the same substance at a lower temperature?

A. Yes, the oil, heated to 360° for twenty-four days, produced the same substance in distilling it half an hour, at a temperature of 400°, and for a moment it rose to 410°; we obtained this substance from it, we could not continue the experiment any longer, for a strong heat arose on the oil, which passed into the receiver.

Q. At a temperature of 400°, or from that to 410°, you got the same substance which new oil required a higher temperature to produce? A. Yes.

Q. Were you present at any experiments on that oil, at Mr. Wilkinson's?

A. Yes, that experiment from which we obtained the naptha was made at the same time, in the presence of several chemists.

Q. What other experiments did you make upon that oil, in that state, to throw any light on the nature of its substance?

A. Having ascertained that it produced naptha, the object was, to see the effect of the encrease of temperature; it had been at  $360^{\circ}$  all that morning I understood, and on rising to  $410^{\circ}$  it gave out a great deal of vapour; the bumping and thumping described occurred, and it gave out a great deal of mixed vapour.

Q. Did you try whether that vapour was inflammable?

A. It was considerably so.

Q. Do you distinguish the vapour from gas?

A. Certainly, and also vapours from each other; there were two vapours there.

Q. What were the distinct vapours?

A. There was in the first instance, a great quantity of aqueous vapour; and I have no doubt there was a considerable vapour of this substance, from this pipe; the result was, perhaps, permanent gas; vapour of this substance on aqueous vapour; we could separate the aqueous vapour from the other by holding a cold vessel over it, and by destroying that, the inflammability was encreased.

Q. I want to know what time it took to raise it to  $410^{\circ}$ ?

A. I really do not know, for being engaged in distilling, and that requiring great care, I did not attend so directly to the care of the oil boiler.

Q. From what you observed in your experiments, and your general knowledge, in your judgment, does the process of heating oil, in proportion as it is continued longer, become more dangerous?

A. I cannot have a doubt upon the subject; after seeing the naptha in the experiment, for twenty-three days.

Q. Can you tell us whether the inflammable vapour you spoke of, is heavier or lighter than the atmosphere?

A. The vapour of the distilled oil is heavier than the atmosphere, and so is the vapour produced by the naptha, it is no uncommon thing to know, that inflammable vapour is heavier, though inflammable gas is lighter.

Q. This reservoir that the oil was boiled in, we have heard described, it had a tube?

A. Yes.

Q. To which is connected a pipe?

A. Yes.

Q. What height was the tube at the time you saw it?

A. About two feet from the boiler.

Q. Two feet from the top?

A. Yes, perpendicular on the top of the boiler.

Q. That tube would pass off the vapour, which a candle was applied to light? A. Yes.

Q. Did you catch any of the vapour in a vessel?

A. In a pewter vessel, the vapour passed over the end of the pipe.

Q. Did you then try the application of light to it?

A. Yes.

Q. What was the result?

A. It inflamed within the vessel, as we expected, it inflamed throughout the capacity of the vessel.

Q. Supposing the vessel had been of the capacity of this steam-bin, and the vapour had been collected in it, and by any accident a light applied to it, in your judgment, would it all have inflamed?

A. I do not know the size of the real bin.

Q. Supposing it to be in proportion, supposing the vessel you used was to the real bin, as this is to that?

A. I should not be surprized if it did inflame.

Q. Supposing it was filled with such vapour?

A. Then it must inflame; if it were filled with nothing but the vapour, it would not burn, but if there was common air it would.

Q. After you had tried the experiments you have mentioned, was any experiment tried of heating a vessel, to see what effect was produced upon the oil itself?

A. They rose to  $410^{\circ}$ , and the emission of vapour was continued, the heat was continued to get a stronger vapour, but instead of that we got the oil out.

Q. At what degree had it arrived before you got the oil out?

A. During the boiling, and when we begun to look at things, the temperature was  $460^{\circ}$ .

Q. After it had boiled out and your alarm subsided, you observed it? A. Yes.

Q. In what way did it issue out from the pipe?

A. It passed out in jerks, it was thrown out by a rapid concussion in the boiler; from the appearance of the retort, it was natural to expect it would be so, the formation of the vapour expanded and threw out the oil.

Q. Did you see the oil issue out from the tube?

A. It issued out and struck the ceiling.

Q. At what height was that?

A. I think the distance was four or five feet, I do not know exactly, I think it was about five feet from the end of the pipe to the ceiling; it was a sort of irregular fountain.

Q. And the highest temperature you could observe was 460°?

A. The lowest we observed was 460°, the oil ran into the fire, and the fire was very much encreased by it at the time this boiling happened.

Q. Had the oil, running into the fire, any effect to put the fire out?

A. I did not observe any thing of the kind.

Q. I suppose a great mass of cold oil would put the fire out?

A. I have no doubt you could put a fire out with oil, though at a temperature of 460°, it would be rather difficult, unless an apparatus were contrived for it.

Q. Upon the result of the experiments you have made, do you conceive it to be a safe proecess to be employed in the boiling of sugar?

A. I am sorry to say, after hearing so much excellent evidence, that I cannot say so; I thought so till I made these experiments, I cannot consider it so now.

Q. They have satisfied you to the contrary? A. Yes.

Q. Have you heard the description of this, that there was a pipe that passed up here, and went to a certain distance up that steam-vent, and terminated at a distance of two feet in the steam-vent? A. Yes.

Q. In your judgment, if this cauldron of oil was forced by a hot fire for twenty minutes, or half an hour, and vapour formed that rose up the tube, what effect would that produce, do you think it would find its way out at the summit?

A. It would depend upon the state of things in the steam-vent.

Q. Supposing the sugar-pan is not boiling?

A. If there is no draft, if it is a vapour or naptha it must descend.

Q. There cannot be a draft if there is no steam going up it?

A. The chance of a draft is diminished by putting the iron chimnies in different flues.

Q. If a cold substance be put in here, and that is to be heated by the oil passing through it, it would take sometime before it would emit any steam?

A. I should imagine so, I have never seen the process.

Q. If the pump has not been set to work, and no heat applied, no steam can arise? A. Certainly not.

Q. Then, in your judgment, the vapour would descend without some counteracting cause to throw it up? A. Yes.

Q. You have heard the description given by a witness about the fire forcing its way out of the window and rising up, I beg to put a case to you; supposing that by any accident the vapour has descended, and found its way to the gas-

light here, and that it was to inflame suddenly, in your judgment, would that have the effect of forcing it out of the window?

A. Yes, I should expect such an effect.

*Mr. Scarlett.*—Just shew the Jury the effect of the explosion of the naphtha?

*Mr. Solicitor General.*—There is no necessity to light it.

*Lord Chief Justice Dallas.*—We have so much theory, we are going to have some practical chemistry.

*A Juryman.*—One of the Jury says, he will not believe it till he sees it.

*Another Juryman.*—I do not say that, but I wish to see it.

[*Mr. Farraday* having lighted a small piece of taper, put it into the phial, which, after one or two attempts, produced a feeble lambent flame of a blueish yellow colour, which extinguished the taper, and immediately expired;—a most offensive smell being at the same time perceived throughout the court.]

*Mr. Scarlett.*—If that were heated to a high degree, would it exhibit a greater vapour?

A. It would not have been more combustible, you would have more of it.

*A Juryman.*—What would the colour of that vapour be in the dark? A. White—the colour of flames vary.

Q. What colour would come from the bin lighted with that? A. I can shew the colour.

Q. Would it be a light flame?

A. A pale yellow flame—all flames become blue by dilution nearly, there are few exceptions.

*Mr. Scarlett.*—Was the inflammation that took place, when you applied a light to the vessel that had got the vapour, accompanied with a noise or without? A. Without noise.

Q. Is that the case when vapour of this sort does explode?

A. In a loose way; the noise depends on the portion of vapour inflamed; if confined, or if the mixture be perfect and accurate it will have noise; the less rapid the combustion the less the noise.

Q. So that to make a noise, there should be a particular mixture of atmospheric air?

A. And it should be confined. You may make *explosion* without *noise*, and generally speaking, it would be a *silent* one.

Q. Have you made any experiments upon the comparative heat at which sugar and oil will emit any vapour?

A. Yes, I made some experiments on the 12th of February last.

Q. What was your experiment as to sugar?

A. I could get no inflammable vapour from sugar below

400°. I could not get with a syrup, inflammable vapour below 440°.

Q. What distinction is there between sugar and syrup ?

A. On hearing the evidence of yesterday, I made an experiment on sugar alone, last night, I could get no inflammable vapour below 420°. I was surprised to see the temperature at which it was obtained, there is every chance that a variation will take place, I had some at 440°; if the heat were continued on sugar, it may produce an effect similar to what it would have on oil.

Q. So as to give out inflammable gas at a lower temperature?

A. Yes; or if sugar had been heated highly at first, and then suffered to cool and heated again, it would give out gas at a lower temperature, I think.

Q. You think this process of heating sugar by oil, is more hazardous than the ordinary mode?

A. I cannot help thinking so.

Q. State your reasons for thinking so?

A. I should have thought it dangerous from the mere chance of the effect of long heat on the oil, and from knowing the oil itself was rendered more combustible by the long heat, and the emission or the production of an inflammable vapour at low temperatures. The experiments of Mr. Taylor would also strengthen my opinion, that it was a dangerous process, and the production of the naptha is a decided circumstance in forming my judgment on the subject, knowing the properties of this vapour.

Q. Having got that at the temperature of 410°, leaves no doubt on your mind it is dangerous?

A. Yes; and when it is attended with the danger of the oil boiling over, there cannot be a shadow of doubt on my mind, that it is a dangerous process. I do not know whether I should advert to another cause. I wish to relieve myself from opposition to the respectable evidence given; my opinions are in opposition to theirs. I would refer to the danger of leaving the boiling, and the circumstance of the oil being heated more rapidly than other fluids, or at least than water. I found that my own train oil requires only half the quantity of heat to raise it to a certain temperature, that water does.

Q. You mean oil that has before been heated?

A. No, recent oil; I state that, to excuse my difference of opinion from others. Again, although this is obviated in a great measure, by the exposure of open iron vessels to the air, because there the heat is lost very fast by the dispersion of the air, as is the case with the safety lamp referred to yesterday, yet still, in a boiler covered by brick-work, there

is no reason to suppose the oil is at all difficult to heat at high temperatures; I mean about the boiling point of oil, when the external part is covered by brick-work, and will retain heat.

Q. You are not of opinion that it is more difficult to heat the oil in proportion as the temperature is encreased?

A. *I think not.*

Q. And your reason is something connected with the brick-work?

A. It prevents the dispersion of the heat from the surface of the boiler.

Q. Do you think a small additional application of fuel would raise it suddenly to a high temperature?

A. That would depend upon the quantity of oil. It was stated yesterday, that oils at high temperatures required more heat than those at low temperatures; I know no reason for that.

Q. Is your experience contrary to that? A. Certainly.

Q. You have experienced the contrary?

A. To some extent; oil heats more rapidly than water.

*Cross-examined by Mr. SOLICITOR GENERAL..*

Q. Do you mean to say, that after oil has got up to a certain temperature, continuing the same degree of heat for the same time that was employed at a lower temperature, there will be the same proportion in the encrease of heat?

A. That depends upon circumstances.

Q. Suppose it took ten minutes to raise it from 400° to 420°, with a certain quantity of fire, continuing the same fire for the same period, would it get on to 440°?

A. It would depend on the way the boiler is cast, and the size of the fire. If I take a source of heat much higher than the oil has required, and economise that by covering it, it will increase.

Q. The heating cause is of course greater than the heat of the oil? A. Yes.

Q. Supposing the heating cause to be, during the whole progress, greater than the heat of the oil, I ask whether it will get on as rapidly from 420° to 440°, as from 400° to 420°?

A. It cannot, unless the source of the heat be much higher than the heat of the oil.

Q. Then as you advance in the temperature of the oil, you must advance in the temperature of the heat?

A. So many degrees, unless your source of heat be much higher than the oil.

Q. As you advance in the temperature of the heating cause, so, likewise, in the same degree, it is difficult to add to it?



A. I do not see that.

Q. If you get your fire to 700 or 800°, is it not more difficult then to add 100°?

A. The temperatures of fire are much greater than those of oil.

Q. I ask you if it does not require more difficulty and time to add to a fire intensely burning, than to one of a lower power? A. Yes.

Q. So that the proposition of other witnesses is correct, that in proportion as you add to the heat, you diminish the facility of augmenting it?

A. Certainly; but the statement is not correct as a general one.

Q. The general statement of experiment from every witness called was, that it was difficult, after you got the oil beyond a certain temperature, to add materially to it; do you agree or disagree with that opinion?

A. In the *material point* I do not agree with that.

Q. Have you made any experiments to ascertain that fact?

A. In the oil at Whitecross Street, the difference was so small it did not attract my attention.

Q. Have you made experiments to ascertain whether the accessions of heat at a high temperature are not more difficult than at lower ones? A. No.

Q. And yet you give your opinion on the point, in opposition to all the evidence of yesterday; but, being embarked in the cause, you are rather zealous: supposing sugar not to be in a state of boiling or emitting vapour, and the temperature of the sugar-house greatly above the outward air, will there not be a current up the chimney? A. Certainly.

Q. Though there is no vapour from the sugar?

A. Certainly.

Q. Perhaps you know it is an object to keep the temperature as high as possible during the night?

A. *I do not know that.*

Q. The oil keeps a considerable temperature during the night? A. Yes.

Q. Then in that case, there would be a considerable draft at four o'clock in the morning? A. I cannot say that.

Q. The place is shut up during the night, to retain the heat; in the morning the men go in, and open the lower doors, by which the cold air is let in, is not the consequence of that that the hot air will rush up the vents?

A. I should expect it.

*Lord Chief Justice Dallas.*—Dr. Franklin on air up and down chimnies, tells us that.

*Mr. Solicitor General.*—Did you make your experiments upon oil that had been heated in a mass, except that given you by Mr. Wilkinson?

A. I made some on oil I heated myself, for a short time only.

Q. The experiments generally were made on the oil furnished you? A. Yes.

Q. If in whale oil you mixed a portion of that which had been distilled, would not the whole mass be more easily inflammable? A. I should expect so.

Q. And would not the whole mass distil at a lower temperature? A. No.

Q. Would it boil at a lower temperature?

A. Yes, at first, till the distilled part went off.

Q. Would not that combine with the other parts?

A. It will separate by distillation in great part, I expect.

Q. Are you confident of that?

A. I can only judge from my knowledge of chemistry.

Q. If a combination of that kind took place, would it not be a chemical combination, so as to effect the whole mass?

A. I should expect not, but I cannot say.

Q. According to your opinion, the process would go on in that way for a considerable time; it would boil earlier?

A. Yes.

Q. It would inflame sooner? A. Yes.

Q. Do you happen to know whether sulphuric acid is used to purify oil? A. I do not know.

Q. Suppose it were so used, would it have the effect of altering the oil, and make it boil at a lower temperature?

A. I do not know.

Q. You cannot give an opinion on that? A. No.

Q. You have heard that it is used to purify oil?

A. I have heard that it is used, in some way, in oil.

Q. Is not that naphtha very offensive when it explodes?

A. Yes. If perfectly burnt it is not *very bad*.

Q. Suppose it went off by an explosion?

A. It would be *very unpleasant*.

Q. A large mass of it would be very offensive?

A. I cannot say whether a *large mass* would, in a *small experiment* it is so.

Q. Then it would be more in a large mass?

A. *That does not always follow*.

Q. But in your judgment it would be very offensive?

A. I should expect it would.

Q. That substance is not properly called naphtha?

A. No; but this is similar to it.

Q. With respect to the gases of sugar, you do not mean to say the experiments stated yesterday were incorrect—the sugar may have foreign mixture in it?

A. I do not mean to impugn the evidence of yesterday, only to state my experiments.

Q. When you speak of inflammable vapour, do you mean gas?

A. It is inflammable gas, I should presume; it is inflammable gas mixed with aqueous vapour.

Q. You say that the vapour produced by the mixture before you, is more heavy than atmospheric air, in what proportion?

A. I have not ascertained that, it is a very light gas, it sinks rapidly.

Q. That depends on a variety of circumstances?

A. It depends upon its weight.

Q. Can you form any opinion upon the subject?

*Lord Chief Justice Dallas.*—Does it not likewise depend upon the degree of heat, and consequent density of the air?

A. Not the weight of the vapour.

*Mr. Solicitor General.*—Can you form any opinion as to the specific gravities of the two? A. No.

Q. You say, before you tried any of the experiments on the subject, you thought it was a very safe process?

A. I had not turned my attention much to it, *but I thought so.*

Q. But in consequence of these experiments, which you have made with a view to give evidence here, you have come to these conclusions. A. Yes.

*Re-examined by Mr. SCARLETT.*

Q. The Solicitor General has put to you, whether the oil at a certain temperature where the fire is given, does not advance more slowly than at a lower temperature? A. Yes.

Q. If the fire is 1000° and you want to raise oil to 600°, it will travel fastest at first? A. Yes.

Q. Is not that true with every other fluid?

A. There are other circumstances, the quantity of vapour given off, the elastic matter, whether gas or vapour, carries off heat with it, and in sugar that vapour is more abundant, and therefore, carries off more heat than oil.

Q. And therefore it would take longer to heat sugar than oil?

A. I speak of the ratios; their capacities of retaining the heat are different.

Q. *Cæteris paribus*, all liquors rise in proportion to the heat? A. Yes, if none is lost by radiation.

Q. Have you ascertained sufficiently, that the oil often

exposed to fire, and allowed to go cool again, advances more rapidly to any given temperature?

A. No, I have not ascertained that.

*A Juryman.*—There is one observation you made I do not understand—you say, when the thermometer was at 460°, the oil rose out of the pipe four or five feet, and then descended?

A. It rose to the ceiling.

Q. And got into the fire and made a flame? A. Yes.

Q. How did it get into the fire?

A. It passed by the side of the boiler, it arose upon the boiler, and washed down.

Q. Then it was not closed, as that is?

A. The boiler itself was not closed, the sides of the boiler were left bare to the air.

Q. And the oil went down by the side of it? A. Yes.

Q. Then it was not on the principle of that boiler?

A. No, it was not in that form.

Q. If the oil could get to the fire, the fire must have been exposed to the external air?

A. It ran between the boiler and the bricks.

Q. You say it made a considerable blaze, but I do not think oil falling on that boiler would go into the fire?

A. No.

Q. It could not be air-tight?

A. No, there were crevices between the boiler and the fire.

*A Juryman.*—Their fire could not have been made on the same principle as that?

*Mr. Scarlett.*—It was brought as nearly as could be to that, to give it the same proportion of heat.

*A Juryman.*—I conceive the experiments of the last witness do not apply to such a boiler as this.

RICHARD PHILLIPS, Esq.

(*Lecturer on Chemistry at the London Institution.*) Sworn.

*Examined by Mr. Serjeant BLOSSETT.*

Q. You are a chemist, in what situation are you employed? you are a professor of chemistry I believe?

A. I am a lecturer on chemistry, at the London Institution.

Q. Have you tried experiments with oil? A. Yes.

Q. You are a professor at the Royal Military College?

A. I am.

Q. Have you made any experiments upon oil?

A. I have made some experiments.

Q. Have you tried those experiments with fresh oil, and oil that had been frequently boiled? A. Yes.

Q. Have you observed any difference with respect to the combustibility of the one and the other, at certain degrees of temperature? A. I have.

Q. Have you made experiments privately by yourself?

A. Yes, I have, to a certain extent.

Q. When did you begin to make those experiments?

A. I do not recollect the precise date, I think about two months since.

Q. What was the result?

A. The result of the first experiment was, what has been generally stated, that recent whale oil boiled at  $600^{\circ}$  and emitted a vapour, continually inflammable vapour. It is difficult to ascertain when oil boils.

Q. Because mercury boils before oil? A. I believe it does.

Q. What experiments did you try by yourself on that oil, that had been before heated?

A. The first experiment was this, I heated in a retort to  $360^{\circ}$ , during about thirty hours; I cannot answer for an hour or two, about *half-a-pint* of whale oil for about thirty hours, up to  $360^{\circ}$ ; the reason of my heating it to this point will, of course, be obvious: after I had so done, I should state, however, that the oil had thickened considerably, and become darker, that is to say, it was thicker when it was cold. I then heated it pretty suddenly up to about  $500^{\circ}$  and there distilled over, at that temperature, a volatile oil; this oil, I have a specimen of, this is a portion of it [*producing it.*]

Q. Did you observe at what temperature any combustible matter arose?

A. Not at that experiment. But I wish to state the result of this experiment: this oil, though it appears extremely fluid now, if taken into a cold atmosphere, becomes solid; this shews that the oil having been heated only for thirty hours, had undergone a very considerable change, for a volatile oil is produced from it at  $500^{\circ}$ , which is solid. This is one among the numerous effects that have been noticed in oil.

Q. Were you aware of that fact before you tried that experiment?

A. No: I knew that heat produced certain changes, but the nature of them I was ignorant of.

Q. When did you make an experiment on the degree of combustibility in the vapour from oil?

A. About six weeks ago; a private experiment.

Q. At what degree of temperature did you obtain a combustible vapour, from oil that had been heated before?

A. Do you mean for a short time, or a long time?

Lord Chief Justice Dallas.—Both.

A. This is combustible at about 500°; that is the temperature at which it gives a vapour; and oil that has been heated gives it out at 400°. I heated to about 400° or 410°, some of the oil that has been frequently alluded to as having been heated to 360° for twenty-three days, and I found this give out an inflammable vapour.

*Mr. Solicitor General.*—This is the public oil? A. Yes.

*Mr. Serjeant Blossett.*—And oil heated 360°, for many days?

A. Yes.

Q. That gave inflammable vapour at 400°? A. Yes.

Q. Did you examine that vapour particularly, to ascertain whether it was vapour or gas?

A. I have no doubt it was entirely vapour, and not gas; because the temperature was not sufficient, in my estimation, to convert oil into gas. From that experiment which I first described, and from this public experiment, I argue, that by the action of the heat a part of the fixed oil is converted into volatile oil, and when a greater heat is applied to it, it is given out in the shape of vapour.

Q. Did you make any experiments as to the relative weight of the vapour, compared with the common atmosphere?

A. I saw, evidently, that the vapour of oil would fall a little, it appeared heavier, for combustion took place below the orifice from which it issued.

Q. Which proves the vapour was then in the act of descending? A. Unquestionably.

Q. You assisted at this public experiment? A. I did.

Q. You heard Mr. Farraday's account?

A. I heard a good deal of it.

Q. What occurred?

A. The oil which had been heated up to 360°, was put into a retort, it was then heated up to about 400°.

Q. The retort you speak of?

A. It was a small glass one, to try the experiment. Some of the oil was put into the retort and heated to 400°, in the manner described by Mr. Farraday, and the effects produced were such as he has spoken to, a volatile oil was produced.

Q. Did you see the oil spurt up?

A. Yes, from a pipe twenty-two inches from the top of the boiler.

Q. Was that pipe from the boiler in which the oil had been boiled? A. Yes.

Q. Did you see the fire? A. Yes.

Q. And the nature of the boiler?

A. Yes, I saw the general construction of it.

Q. How was the fire applied? A. I did not examine that.

Q. Did you hear Mr. Farraday's opinion respecting the vapour descending?

A. I did; and I have no hesitation in saying, that if the bin were filled with vapour, or any portion of vapour, from the oil, it would of course burn; but not with explosion, I should think.

Q. Would it burn with the sort of flame the first witness described?

A. It would be precisely such an appearance as that which has been described by the two witnesses, I forget their names.

Q. The witness who described the flame? A. Yes.

Q. Considering that, and the experiments you have made, and the precise nature of the machine before you, is it your opinion, or not, that it is a machine of a dangerous nature?

A. I certainly think so, differing, as I do, from high authority.

Q. Were you aware, before you made these experiments on oil that had been heated for a long time before, that such qualities belonged to oil in that situation?

A. I did not know the precise effect, I knew it changed in its nature.

Q. But you did not know the nature of the change? A. No.

Q. Have any other experiments been tried by other chemists?

A. I think not, or I should know the result.

Q. You are not aware of the experiments having been tried? A. Certainly not.

Q. It was a new thing to you? A. Yes.

*Cross-examined by Mr. SOLICITOR GENERAL.*

Q. That in your hand is *thick*, when it is *cold*?

A. Yes; there are some volatile oils thick when they are cold, oil of aniseed is; this is formed at 360°, and distilled at 500°.

Q. That is the distillation? A. Yes.

Q. It has never become quite solid?

A. Nearly as *solid* as *butter*; it was so, in a room this morning, but the temperature of the court has liquified it.

Q. You have mentioned that this vapour has been delivered out by the old oil, is it delivered out in considerable quantities?

A. Very considerable; it is formed in large quantities, I think.

Q. Of course, all that goes off in vapour in that way, is subtracted from the oil?

A. There is a great deal of water formed at the same time.

Q. Where is it formed from?

A. By a portion of the oxygen and hydrogen uniting.

Q. Still formed from the material of the oil? A. Yes.

Q. What was the quantity of oil in this public mass you were operating upon?

A. I understood it was about twenty-three or twenty-four gallons.

Q. At the temperature of  $400^{\circ}$ , what quantity would be given out in four hours?

A. I cannot say, a considerable quantity.

Q. If  $400^{\circ}$  would produce inflammable gas,  $360^{\circ}$  would emit vapour?

A. Not one of the volatile oils that was attained, but a greater heat produces it.

Q. What was the lowest point that it emitted vapour at?

A. We continued it but for a short time. I did not examine it, except towards the conclusion.

Q. Were you present every time the public experiment was made? A. It was made but once.

Q. How long?

A. We were there several hours one morning.

Q. That was the only time that you were called on?

A. That was the only time I was at the experiment. I called once or twice to see how it was going on.

Q. It produced a large quantity of vapour?

A. When heated to  $460^{\circ}$ , it gave out aqueous vapour, and inflammable gas.

*Foreman of the Jury.*—You have said, that if the vapour which passes through the pipe, from the retort, had come in contact with flame, it would take fire?

A. No question of it whatever.

Q. Then, considering that that pipe is carried up sixteen feet, into a wide brick flue, could you conceive that, without coming in contact with flame, it could, upon any occasion, or any how, get on fire?

A. Not without coming in contact with flame; but the oil, as in the public experiment, would be forced out by sudden ebullition, and run down to the fire, and take fire.

Q. In such a fire place as that?

A. Yes, certainly, more especially if the man, seeing the danger in which he was placed, had taken out the fire, for then there would probably be inflamed fuel in the ash-hole; and, therefore, I can see extremely well, how such an accident could happen. There is another reason why I consider it more dangerous than the common mode of heating under the pan, which is this, I have made many enquiries, and have never been able to hear that any accident has happened from



the sugar boiling over; and I have made experiments repeatedly, and I never have obtained flame from sugar heated to 440°; whereas, the oil gives vapour at 400°. I made the experiment this morning, to try whether I could come nearer the Gentlemen who have given evidence.

*Mr. Serjeant Blossett.*—You say, you think it is possible, if the oil had spouted out, as you saw at the experiment, and had run into the fire place, it might have been the occasion of the conflagration? *A.* I have no question of it.

*Q.* Or, that if the man had been taking out the fire, it might have come down among the ashes; do you think that the man himself, who was at the fire, would be able to afford you any useful ———

*Lord Chief Justice Dallas.*—O dear no.

*Mr. Solicitor General.*—No: any body can judge of it.

*Mr. Scarlett.*—My learned friend will answer it in his reply.

*A Juryman.*—How high did the other go?

*A.* About seven feet, and in this larger boiler there were 100 gallons, and the force would probably be in some ratio, as to the quantity.

*Q.* What time would it require to effect that?

*A.* A few minutes after it was heated to 360°, supposing they were at work at that, and the pump stopped in twenty minutes; I am certain, by a strong fire, the oil would spout out at the end of the tube.

*Q.* If the fire had been lit only twenty minutes?

*Lord Chief Justice Dallas.*—This applies not to the night in question, but to the general question.

*Mr. Scarlett.*—There is no evidence when the fire was lighted.

*Mr. Solicitor General.*—There is evidence from whence the Jury will infer when it was lighted.

*A Juryman.*—We have evidence it was out at night.

*Mr. Serjeant Blossett.*—Will your Lordship allow me to ask this witness one more question; did you make any particular observation as to the increase of the degree of heat in the oil, from 360°, in the course of twenty minutes, at any time?

*A.* It was heated in twenty minutes, from 360° to 460°, at which temperature it issued from the boiler.

*Q.* The length of the pipe, I think you say, was two feet?

*A.* Yes.

*Q.* And from the top of this pipe, it rose up, how many feet? *A.* Five feet.

*Q.* And was stopped by the ceiling? *A.* By a girder.

*Q.* That was the height at which it actually rose, from the pipe? *A.* Yes.

Q. If that pipe had been much longer, what height would it have risen to?

A. It is impossible to tell—if the pipe had been up to the ceiling, it would have gone up.

Q. You cannot form any idea from the impetus, up to what height it might have been continued, if the room had been higher?

A. No.

*Mr. Solicitor General.*—What is the length of your pipe?

A. Twenty-two inches.

Q. When you had raised it to 360°, what was it like?

A. A boiler.

Q. Surrounded with fire on every side?

A. It was only heated at the bottom.

Q. Was there a communication for the flames at the side.

A. I believe not; I have no recollection about it.

Q. In raising it from 360° to 460°, in twenty minutes, you did that by encreasing the fire?

A. Yes, we were going to raise it.

Q. With as much exertion as possible?

A. With heat enough to produce the effect; we were going to try the effect of heating the oil up to 500°, rapidly.

Q. And you did all you could to raise it?

A. There was a very good fire.

Q. Did you leave it as it was?

A. The fire was encreased, unquestionably, intending to raise it to 500°.

Q. Was the pipe dipped into the liquid, or not?

A. I do not know that.

Q. Whether it was dipped into the fluid or not, you do not know?

A. I do not know; I have no reason to suppose it was.

Q. You made some experiments on the sugar: was that refined, or raw? A. Both.

Q. Did you find the same temperature necessary to produce gas, in one and the other?

A. I have produced gas from neither; the temperature I carried it to, of 400° ———

*A Juryman.*—You do not know whether the pipe was immersed in the oil, or not? A. I did not look.

*Mr. Scarlett.*—We will shew that; but the last witness explained that it was not: [*To ——— Wilkinson.*] How was the pipe put in?

A. It did not go below the plate that formed the top of the boiler; it was screwed at the top of the boiler.

*A Juryman.*—It was not immersed in the oil?

A. No, it did not go beyond the top plate, to my knowledge.

Q. Was it a continual stream of oil that went out?

A. No, it emitted inflammable vapour, and while it was coming through the top, it came, as before described of the inflammable vapour.

Q. It was not a constant stream?

A. No, it came through by jerks.

Mr. Serjeant Blossett.—How was the fire applied?

A. Only to the bottom of the vessel.

### DOCTOR JOHN BOSTOCK,

(Lecturer on Chemistry at Guy's Hospital,) Sworn.

Examined by Mr. Serjeant HULLOCK.

Q. You are a physician? A. I am.

Q. Have you applied yourself to chemical studies for any length of time? A. For many years.

Q. Were you ever a lecturer upon chemistry?

A. At Guy's Hospital.

Q. Did you ever make any experiments with respect to the nature of oil?

A. I have made some formerly; but not, perhaps, very much in point to this present subject.

Q. Were you ever present, lately, at any experiments in point?

A. I was present at, what has been called, the public experiments at Mr. Taylor's.

Q. When was that?

A. On the forenoon of last Thursday.

Q. Was that the first time you had been there?

A. It was.

Q. At what period of the day did you go?

A. I think it was about twelve.

Q. And how long did you continue there? how long did the experiment, which was the object of your attending there, continue?

A. The whole series lasted till between four and five o'clock.

Q. Between four or five hours? A. Yes.

Q. Will you have the goodness to state to us the nature of the experiments, which you there witnessed, in your own way?

A. The two main objects were, first of all to observe what change was produced on whale oil, after being long subject to a moderate temperature; the second was, to observe at what temperature a volatile or inflammable matter was given out from oil that had undergone this change; we were informed that Mr. Taylor had subjected oil to a temperature not exceeding  $360^{\circ}$ , or a degree or two above, and that for the space of two-and-twenty, or three-and-twenty days.

Q. Was that the oil that was then in the vessel?

A. That was the oil that was then in the boiler.

Q. Do you remember at what degree of temperature it was, when you went there?

A. I myself looked at the thermometer, it was a degree or two short of  $360^{\circ}$ — $357^{\circ}$ , I think.

Q. State, if you please, what course was adopted for the purpose of raising it?

A. The first experiment was, respecting the production of the inflammable matter from this oil; for which purpose Mr. Farraday, who was of the party, put some of that oil into a retort: the retort was furnished with a thermometer, to mark the temperature of what it contained; that was heated over a lamp, and the product received into a glass vessel, called a receiver.

*Lord Chief Justice Dallas.*—Specify the quantity upon which this experiment was made?

A. Perhaps *half-a-pint*; that I say upon conjecture, at a temperature of not more than  $410^{\circ}$ , as indicated by the thermometer. We observed portions, in the form of drops, of what appeared to be a volatile oil, appear in the receiver; this being procured, appeared to be a highly inflammable fluid.

Q. Was flame applied to it? A. Flame was applied to it.

*Mr. Solicitor General.*—The moment it is distilled it is highly inflammable, there is no doubt of it.

*Mr. Serjeant Hullock.*—Did it inflame immediately?

A. Yes, the retort then became filled, and bubbled up so much with frothy matter, that that experiment was disposed of. The next experiment was upon the state of the oil in the boiler; the oil was reduced to a state like pitch, in appearance black, and, when cold, apparently denser, and more tenacious than recent oil.

Q. That was the oil in the boiler?

A. Yes, which had been subjected for twenty-three days to a heat of  $360^{\circ}$ , a little of which was taken out for the purpose of observation; our object was to ascertain at what temperature this oil gave out an inflammable vapour; for which purpose, we watched the thermometer, and applied a taper to the top of the tube, communicating with the upper part of that boiler.

*A Juryman.*—Was this when the oil was in a pitchy state?

A. Yes, it was all of it reduced to a black state; but the thick consistence takes place when it is cool; by heat it becomes perfectly fluid. The flame being applied to the top of the tube, I think many degrees under  $400^{\circ}$ , there were

small jets of flame; at a little more than  $400^{\circ}$ , those jets became more considerable; and at about  $445^{\circ}$  or  $450^{\circ}$ , they may be said to have been very considerable, taking into account the size of the tube, and other parts of the apparatus. We then applied an inverted vessel to the upper part of the tube, and upon bringing a light to the lower part of this inverted vessel, the whole instantly became a flame; we coiled up a sheet of paper in the form of a cap, and just put it loosely on the extremity of the tube, and that, in the same way, upon applying a taper, became immediately filled with flame. After having satisfied ourselves with the emission of gas, at that temperature, we then determined to raise the heat, to observe the effect of it, and no doubt to our surprise, in a short time, about a quarter of an hour or twenty minutes, the oil spurted out, or darted out, from the end of the tube, in considerable quantities; it was not then very easy to examine the thermometer, in consequence of this oil dashing about; but as soon as we could do it, it appeared not to be more than  $460^{\circ}$  or  $470^{\circ}$ , I am not certain which.

Q. Some persons who were present would take a memorandum?

A. Several gentlemen present looked at the thermometer, when they could get to see it, but it was difficult.

Q. Were any means taken to apply the fire, before you examined the thermometer?

A. We opened it to take out some of the fire; we were somewhat alarmed at what might be the effect of so violent an experiment going forward, and it was found necessary to dash cold water upon the front of the furnace, and upon the ash-pit, to put it out. The oil appeared to be catching fire as it fell down.

Q. Do you know whether the thermometer underwent any encrease, in the progress of taking out the fire? A. I do not.

Q. To what height did the oil raise itself?

A. I should conjecture, the ceiling of the room from the boiler might be eight or nine feet.

Q. Was it stopped by the ceiling?

A. Certainly, it dashed with violence against the ceiling.

Q. For what length of time did that continue?

A. It continued till the fire was reduced, and for a long time after, without much apparent diminution for some time; speaking in general terms, I should say, for several minutes there was no diminution.

Q. You have heard the nature of this boiler, and of the process; in your judgment, is that a more hazardous operation than the old process of boiling the sugar in the usual way, by fire?

A. I am, perhaps, no judge of the old method; but I think no person could view the experiment in White-cross-street, without seeing it was an agent of extreme activity and danger.

Q. That is the experiment you have been detailing?

A. Yes, the facts were, I believe, quite new to all the parties present, and I believe new to chemists in general, and I believe had not been suspected, in a great measure.

Q. The facts were new to you? A. Yes.

Q. As far as you know, were they new to the chemical world in general?

A. I presume the change in oil, by the heat of  $360^{\circ}$  for some days, is a very important chemical discovery, which was not before known.

Q. You have stated, that the inverted vessel in which you collected the vapour, flamed generally?

A. Yes, that appeared to be full of flame, speaking in popular language.

Q. Supposing that a vapour of that description, had been by any means collected in this, which is called the steam-bin, would that go off in the same way by a light applied to it?

A. I conceive that if it was filled, it would act in the same manner; except in the difference of scale, it appeared to be a similar kind of process, it was done to imitate it; it was by no means air-tight.

Q. In your judgment, a similar result might have been produced on a larger scale; in that way?

A. The subject is so new, we can but conjecture; but from the experiments, I should think it probable.

Q. Supposing that result should ensue from that cause, what effect would it produce, in your judgment, upon the adjoining windows?

A. There can be no doubt there would be some eruption of flame.

Q. Have you heard the two first witnesses called, who gave an account of what they first saw? A. I have.

Q. Was the exhibition which they described, and represented themselves to have seen upon that occasion, similar to that you should have expected?

A. I think it was, considering the great difference of scale between our experiments and that.

JOHN GEORGE CHILDREN, Esq. Sworn.

*Examined by Mr. POLLOCK.*

Q. Have you pursued the study of chemistry?

A. I have.

Q. Were you present at the experiment made at White-cross-street? A. I was, part of time.

Q. Were you there when, the boiler being raised to 460°, the oil spouted out to the ceiling? A. I was.

Q. Did you see part of the vapour caught?

A. Yes, I did, previous to its being raised to 460°; at 408° or 410°; I took no notes.

Q. Have you heard the evidence given by Mr. Farrady, Mr. Phillips, and Dr. Bostock? A. Yes.

Q. Do you concur with them in opinion as to the apparatus before you, to heat sugar by oil; do you consider that to be safe, or dangerous? A. Dangerous.

Q. Are you acquainted with the ordinary mode of boiling sugar? A. Merely from report, I never saw it.

Q. Compared with that mode of boiling sugar, are you able to form any judgment, whether this plan is more dangerous? A. I should consider it to be more dangerous.

Q. Do you know the mode in which fire is applied to sugar in the ordinary way?

A. It is applied under the pan, I believe.

Q. Assuming it is as there described ———

*Mr. Solicitor General.*—Ask him whether he was ever in a sugar-house in his life?

A. I never was: I have no doubt of the fact, but I cannot swear to it.

*Mr. Pollock.*—Assuming that fact to be so, are you able to form a judgment on the subject?

A. I consider the new process by oil, is the most dangerous of the two; when I consider the state of the oil after long boiling, taking for granted that the oil I saw, oil that had been heated at 360° for twenty-three days——

Q. Did you hear the testimony of the two first witnesses who saw the window, and the fire coming out from it?

A. I did.

Q. Did the experiment that you saw from the vapour of oil, correspond with their description?

A. I think so, I think the vapour in the steam-bin, would have produced the effect they have described.

Q. If, at the time, there were oil running down, what would be the effect of that?

A. I should expect that that would be fired with the same cause.

*Mr. Scarlett.*—Supposing the vapour is on fire in the steam-bin, and the oil running down, would not that encrease the conflagration? A. I should think so.

*Mr. Pollock.*—Does that model point out to you suffi-

ently the mode in which sugar is boiled without the oil, taking out that zig-zag pipe, to enable you to form an opinion upon the subject?

A. Yes, taking it for granted this, without the pipe, would be the model of a common boiler, if that correctly represents the common boiler, it does.

JOHN TAYLOR, Esq.

(*Chemist and Engineer, &c. &c.*) Sworn.

*Examined by Mr. SCARLETT.*

Q. Are you a partner with Mr. Martineau? A. Yes.

Q. You are a partner in a patent, have you any patent?

A. I have a share in two or three patents: one is a patent for making gas from oil; and a share in a patent for distilling by steam; and I had a share in a patent for boiling sugar by steam, that right I sold to Mr. John Martineau, the father of my partner; I have no share in that, nor have I had since 1816; it was immediately sold.

Q. You have not more interest in supporting a patent than Mr. Wilson has on the other side?

Q. I have no interest in any thing connected with the sugar trade at all.

Q. How long have you made gas from oil?

A. My first experiments were five years ago; I was led to them, from my observation on other substances. I am a partner in a very large manufactory.

Q. Have you had a good deal of experience in the processes by which oil is altered in its form? A. Yes.

Q. From your experience of the article, do you think it a very safe article to be used to apply heat to any other substance?

A. No, I do not think it is a very safe article; I did not think so some time ago, and my opinion has been confirmed since. I considered the subject some time ago, with reference to a plan I submitted to apply oil to heat some substances; and we abandoned it, because we thought it dangerous; that was about the year 1816.

Q. State what your reason was at that time, for thinking it dangerous?

A. We canvassed the thing then a good deal; we thought it would be a main object to the plan of carrying it into manufactories: what we considered would be considered a dangerous agent, and on that account mainly, we agreed to abandon the proposal.

Q. You make use of tar oil?



A. Yes, we distil tar, and produce tar oil; I am not engaged in the manufactory now, but I was within two years.

Q. Is the oil distilled from tar in a volatile state?

A. Yes, it is volatilized to distil it, and condensed, it then becomes a volatile oil.

Q. Have you observed, in that state, whether, upon the application of heat, it emits any vapour?

A. Yes, it does, at a pretty high degree of temperature. I believe it requires from 500° to 560°, to boil even tar oil; it is not so volatile as many others.

Q. Have you observed, at a certain temperature, that it emits a vapour? A. Yes.

Q. Is that vapour inflammable? A. Very much so.

Q. Can you state whether that vapour is lighter or heavier than the atmosphere?

A. Heavier: that may be observed by the vapour from the end of the worm, it descends in a stream, like a liquor that is falling.

Q. And that is an inflammable vapour?

A. Yes, part of it is sometimes elevated in the air in clouds, but it generally subsides again after a time; when hot, it ascends, and falls again in cooling.

Q. Have you ever observed any instance or instances, of this vapour having taken fire by accident?

A. Yes, I have: the first, in point of time, was at our tar still-house, where the receiver holding the tar oil was set on fire, and the only cause of it was, a man passing by within three yards, with a broken lamp.

Q. What was the effect?

A. I was present immediately after, and it had communicated by that time to the oil, and set the receiver on fire, and burnt the building down.

Q. Was there any thing like an explosion?

A. I believe not, but I was not present at the time of the fire.

Q. Were you present at any other time?

A. I have seen small portions of the vapour take fire.

Q. Do they make any noise?

A. They do not explode like gas, it corruscates more like lightning: one of them took place on our premises, I was not present at it, but I was there immediately before, and immediately after, and saw the effect, the whole room was blackened, and the windows broken.

Q. How long before was it you were there?

A. I had left the room about ten minutes, and there was a small pan of tar oil in the room heating, there was no vapour

in the room when I left it, that I should have thought dangerous; I was called by the alarm of fire, I ran to the spot, the men had recovered from their alarm, the windows were broken, the room blackened, but every thing was left undisturbed.

Q. You found every window broken?

A. Not every window, but those nearest the pan.

Q. The room was blackened?

A. The whole room; the bottles on the shelves, of which there were a great number, were undisturbed, there was nothing inflammable in the building.

Q. What state did you find the vessel in, that contained the tar?

A. It had taken fire, I understood, but it was covered up to prevent its spreading.

Q. That tar, if it had taken fire, was stopped? A. Yes.

Q. Did you hear any noise? A. No.

Q. But you observed the windows broken that were nearest? A. Yes.

Q. In the process of heating whale oil, have you had occasion to observe whether a similar sort of vapour is extricated?

A. I was led to expect it, but I did not know it.

Q. When did you make experiments upon it?

A. At the time the witnesses have stated to-day.

Q. In your premises?

A. Yes: I made some small experiments, similar to those mentioned yesterday, and I wished to see a more detailed experiment.

Q. Were the experiments you made before, made upon fresh oil? A. They were.

Q. But from some experience you had in the article, you thought, when heated long together, it would produce a different result? A. I thought it probable.

Q. Now the first was on the 16th of February? A. Yes.

Q. Were you present with Wilkinson when you made any observations?

A. I was present with him on the second morning, at seven o'clock, and we added a quantity of recent oil to it, and we made the experiment on which the thermometer was broken, and I abandoned it. I ordered the boiler to be cleaned perfectly, and a new charge of recent oil put in, and I then ordered Wilkinson to keep up the temperature by another thermometer, from 360° to 400°, wishing to see the effect produced.

Q. Was it Pastorelli's thermometer?

A. Yes; we had 400 made by him, and I proved some of them, and found them good for common thermometers.

Q. Did you prove the second thermometer before it was applied by Wilkinson?

A. I believe not; I left it to him to do it; in fact, I left the experiment in his hands.

Q. Did you, from time to time, see the effect produced by that oil? A. I saw it occasionally.

Q. Did you observe there, after some days, that it produced that vapour at a lower temperature?

A. Yes, at various temperatures, from  $340^{\circ}$  to  $390^{\circ}$ . I went in and found the vapour inflammable; I left it to him to make a minute of every thing.

Q. After that you had a fresh supply of oil again, and made the experiment after twenty-three days boiling?

A. Yes, we carried the other experiment up to  $500^{\circ}$ , and then began a new one.

Q. Now I come to the last experiment, was that all fresh oil?

A. It was, to the best of my knowledge. I saw the cask in our yard which we had the oil from; I desired Wilkinson to draw it out, and I believe it was such whale oil as is usually to be bought.

Q. Were you present at the experiments that Mr. Faraday, Dr. Bostock, and Mr. Phillips, have described?

A. Part of them.

Q. Did you see the vapour take fire?

A. Yes, I saw the whole of that; when I came in, the gentlemen were distilling the oil in a small retort, and they then produced it; the oil was at  $360^{\circ}$ , and I said, here is this oil, what shall we do with it, and we agreed to raise the temperature gradually.

Q. When the temperature was raised somewhere to about  $400^{\circ}$ , did you observe any vapour from it?

A. At  $400^{\circ}$  I did not observe it; a gentleman came in and took me away for a few minutes, but at  $410^{\circ}$  I saw it.

Q. I wish to ask you, whether that vapour appeared to you to be the same sort of combustible matter as you had seen from the tar oil? A. Just so.

Q. It took fire in the same manner?

A. Yes, as inflammable vapours of that kind do.

Q. Did it appear to you heavier than the atmosphere?

A. It did previously, and I have observed it frequently.

A. Were you present at what the witnesses have stated, of the oil bubbling out of the pipe above? A. Yes.

Q. Did you ascertain the degree of heat at which that took place?

A. I saw the thermometer just before, and I think it began

at 450°; there was a very short period elapsed between my seeing the thermometer and that taking place; we could not approach the thermometer afterwards, but we found it 460° when we could get to it.

Q. This was the oil that had been heated for twenty-three successive days?

A. I understand so; there was a man put in charge of it to do nothing else.

Q. From what you saw of the nature of the article, I must ask, whether that you conceived that the application of it to boiling sugar diminishes the hazard, or encreases it?

A. I do not consider it a safe process.

Q. I take for granted you are acquainted with the ordinary process of boiling sugar? A. I am.

Q. In your judgment, does this process encrease or diminish the hazard?

A. I think it encreases the danger evidently, because I am not aware of much danger in the usual process.

Q. Do you mean danger in the mere act of boiling the sugar?

A. Yes; a sugar-house is a dangerous thing, but I do not think the mere act of boiling the sugar is a dangerous process.

Q. In what respect is a sugar-house a dangerous thing?

A. I think the stoves which dry the sugar are dangerous, and the sugar drops on the part below the fire, and takes fire.

Q. You do not think the mere operation of boiling the sugar is a dangerous process?

A. I do not, because I do not think the syrup is inflammable at all.

Q. What state do they bring it to?

A. It is mixed with water, and boiled till it is just dense enough to crystallize, solid quantities of sugar separate, but treacle and molasses remain.

Q. At what temperature is that?

A. About 235°, or 240°.

Q. Do they ever bring it to a much higher temperature than that? A. I conceive not.

Q. They would injure the sugar if they did? A. Yes.

Q. What are the means employed to prevent it rising beyond that temperature?

A. They damp the fire very rapidly, a man watches it, and when it comes to the height they want, the fire is drawn out, and water thrown on it.

Q. Have you known it come to 340°, or 350°?

A. No; I am practical refiner enough to say I never saw it.

Q. As you have had some experience in manufacturing

these oils and substances, you see the mode in which the steam from the boiler is carried off, before it is pumped?

A. Yes.

Q. I wish to ask your judgment, whether you think that would, in all possible cases, carry off the steam, supposing there was a passage up?

A. There might be a passage up, without an ascending current; because, as far as my experience goes, currents are so uncertain, they vary from a great many circumstances, particularly, where there are more passages than one; one may be an ascending current, and another a descending current, it takes place in mines.

Q. And in the same shaft?

A. Yes, slight alterations of the temperature alter the draft, and that takes place in chimneys.

Q. You are acquainted with mining?

A. Yes, I was concerned in it for fourteen years.

Q. You had a copper mine?

A. Yes, I have had a great many mines.

Q. Is that a well known thing in mining?

A. Yes.

Q. Sometimes in the same shaft, there is a current up and down?

A. No, a current up one day, and down another day, without things below being changed.

Q. You see the mode in which the steam is let off?

A. Yes.

Q. And the manner the vapour would be let off.

A. Yes.

Q. In your judgment, what would be the effect of a current blowing into these places, *the lateral vents*?

A. There is a plan of this kind in mining to produce a current, those are generally turned to the wind, to receive it; but if the wind turn round, a descending current might happen, the wind entering here, point blank, would probably be forced downward: I should judge that, from knowing these kind of things are used in mining.

Q. Does it not happen sometimes, in an ordinary chimney, that without any alteration in the premises below, a current of air in a particular direction forces down the smoke?

A. I have observed one instance lately, accidentally, where a fire was lit in one chimney, and in the other there was a strong down-cast current; there are four flues, one has a strong fire, and the other none: it appears not improbable in certain cases, that sometimes that might be the case, the boiler has a strong fire, and the smoke passes up the air-pipe, causing a strong ascending current; now it appears to me,

not unlikely, that a descending current should take place here; indeed, we had a case like this in a copper mine of the Duke of Devonshire.

Q. Were you present?

A. Yes, I had to order an alteration in consequence of this, I was at the spot at the time it happened.

Q. What was the effect produced there?

A. The steam-boiler was much like this, the smoke ascended the common height, and it went up very well, except in some days in summer the current altered, and went to the bottom of the mine, this happened occasionally, but seldom; but it endangered the men, and we made an alteration. I mention it to shew these things are very uncertain, and may be altered on certain days.

Q. From your acquaintance with the subject of the vapour, what you have seen of it, and the construction of this machine to receive it, do you think it at all unlikely, that the vapour might be propelled downwards after being emitted, the distance of sixteen feet from the top?

A. I think the air in the steam-vent was dormant, if this of blowing down was.

*Mr. Serjeant Vaughan.*—This question was objected to in our case.

*Mr. Scarlett.*—I ask whether this is an improbable circumstance to take place:—do you think from what you have seen of this, and of steam, that it is a circumstance which might be very likely to take place, that the vapour might be forced downwards?

A. If there was no ascending current, it would collect, I think; a strong ascending current would carry it all up, a smaller current would take less, and no current would leave it there.

Q. We are upon causes that would prevent an ascending current. In an ordinary chimney, have you known instances of change of wind producing a descending current, and sending the smoke into a house? A Yes.

*Lord Chief Justice Dallas.*—And so in every room, there is a draft from the door to feed the fire, and when there is none, the air will descend; therefore, long ago, Dr. Franklin has said, there is a tide up and down the chimney, according to the state of the room.

*Mr. Scarlett.*—Having seen this machine, and knowing the nature of oil, in your judgment, does it add to the danger of manufacturing sugar?

A. I have thought so long ago, and think so now.

Mr. JOHN MARTINEAU, Sworn.

*Examined by Mr. Serjeant BLOSSETT.*

Q. Are you acquainted with the process of refining sugar?

A. I am not a refiner of sugar, but I have been for many years.

Q. Are you acquainted with the common process of boiling sugar.

A. Yes, and I believe with all the processes that have been brought into use.

Q. Do you conceive that there is any particular danger in the mere act of boiling the sugar in the pan?

A. I conceive none at all, I have never considered that a dangerous part of the process.

Q. Have you been a witness to any accident happening from it?

A. I have never been a witness to it, nor have I ever heard of it.

Q. We understand, however, that sugar-houses are dangerous buildings, can you tell us where the danger consists?

A. It consists in the manner of heating the stoves, and the floors in the sugar-house, that is the old mode of doing it, there have been improvements since.

Q. That heating the stoves and floors, is not connected with the boiling of sugar?

A. Not at all, the heating the floors has some remote connection with the fire under the pans, because in most sugar-houses, it is thrown out into the floors from the chimnies.

Q. Up to what temperature do they keep the sugar in general in the pans to crystallize?

A. The point at which, when it is brought to proof is 235°, varying up to 240°, according to the quality of the sugar.

Q. It is then perfectly in a safe state? A. Yes.

Q. Would it injure the sugar to raise it above that temperature? A. Most materially.

Q. Is it the duty of the person to take care it is not raised above that?

A. It is the practice for a man to stand constantly by the pan, and he has no business to leave it; and I do not know that an accident ever occurred from the circumstance of a man leaving it.

Q. With respect to filling the pan, is it ever filled full, or up to what height?

A. There are two distinct processes carried on, and as yet only one of the processes has been remarked on; the first process in the morning, is that of clarifying the sugar, and then the pan is filled to the top.

Q. At what height is the sugar kept for the purpose of clarifying it? A. Very little above 210°.

Q. What ingredients are made use of, how much water?

A. It varies from a third to a fourth, one part of water, to three of sugar.

Q. Then after that, for the purpose of crystallization, is that the second process?

A. Yes, the second process, is boiling the clarified sugar down to the consistency necessary for crystallization.

Q. It is boiled down after clarification, to be crystallized?

A. Yes.

Q. To what quantity is it necessary to reduce it in the pan?

A. The quantity usually put into a pan of the usual size, is about fifty gallons, which forms about five hundred weight of sugar in each skipping, the panful would be nine boilings or skipping of about fifty gallons.

Q. So that only one-ninth part of a full pan is left in to be crystallized? A. Yes.

Q. Then it is far from being full?

A. Yes, it is only a few inches from the bottom.

Q. It must boil pretty fiercely, to boil over.

A. The greater fire there is under it, the less liable is it to boil over; when the fire is slackened by water, the sugar rises three or four inches; but the greater the ebullition under it, the more steady it is; the greater the heat, the more rarified the steam is given off, the less likely it is to rise in bubbles; it is only when the steam is condensed that it rises in bubbles; when the fire is great it is almost free from bubbles.

Q. Can it happen that it can boil over, if it is at all attended to, as it ought to be?

A. I do not conceive it possible to boil the quantity of sugar in it over: I speak now as a practical refiner; I am perfectly aware, for I have been in the habit of trying small experiments with some vessels, and I have found it extremely difficult to keep the sugar in the pan, but not so in a larger way.

Q. You have turned your attention to chemical experiments?

A. I have got a general knowledge of chemistry.

Q. Having this knowledge of the sugar process, have you considered the nature of this invention of boiling, by means of oil? A. Yes, I have.

Q. What is your opinion with respect to the dangers of that process, as compared with the former process?

A. Always observing, that I do not think the old process



by any means a dangerous one, I think the plan of boiling by oil, incurs a greater risk; I should have had that opinion, before the experiments I have seen, but they confirm my opinion; because they have thrown completely, a new light upon the subject, I should have thought the introduction of boiled oil would have been considered dangerous.

Q. Were you present at the experiments?

A. Yes, I was.

Q. At the experiment made last Thursday, at White-cross-street?

A. I was.

Q. You saw the effect of heat upon oil that had been at a heat of 360° for a course of twenty-three days?

A. Yes.

Q. Should you consider the introduction of a large quantity of oil in that state, which had not been subjected to heat only twenty-three days, but much longer, into a sugar-house, as an encrease of the risk?

A. I should certainly consider so; I cannot say to what extent, but I certainly should consider it an encrease of the risk.

Q. You saw what the nature of the oil was, and you saw the experiment tried?

A. Yes, I witnessed the whole of them, and the former ones also.

*Mr. Serjeant Vaughan.*—Have you the patent that has been spoken of?

A. I am not legally concerned in it.

Q. You have the beneficial advantage from it?

A. No, I cannot be considered the proprietor of it?

Q. Do you use it, in fact?

A. No, I am not a sugar refiner at this time.

Q. It is your father?

A. No, neither of us.

Q. It is your father has the patent?

A. Yes; but he is not in the sugar trade at present. I have been a refiner for fourteen years, ever since I was a boy at school.

*Mr. Serjeant Blosset.*—Are you acquainted with the nature of these chimnies, the steam-vents, to take off the steam?

A. Yes.

Q. Do you think it necessary to have dampers?

A. I understand it is, but I have not seen any sugar-house so constructed, it is a late invention.

Q. Do you know the steam that rises from sugar?

A. Yes.

Q. Do you ever take any notice whether that steam always passes up the steam-vent, or remains in the steam-bin?

A. That very much depends upon the state of the weather;

sometimes, for a week or so, without being able to find the real cause of it, the whole of the fill-house will be filled with steam, so that you cannot see across it, and that would continue for a considerable time.

Q. For how long?

A. If the weather lasted the same, it would continue for several days; it is a fact well known, that that frequently happens.

Q. Then it is not true, in point of fact, that the steam always escapes?

A. There must be a great deal that does not go up, but how much I cannot say.

FREDERICK DANIEL, Esq. Sworn.

*Examined by Mr. Serjeant HULLOCK.*

Q. What are you? A. A sugar refiner.

Q. How long have you been in that business?

A. Ten or twelve years.

Q. Have you turned your attention to chemical pursuits also? A. Yes, a good deal.

Q. Were you present at any of these experiments?

A. No, none of them.

Q. You can give us some information with respect to the old mode of boiling sugar? A. Yes.

Q. State the way in which that operation is performed; what is the first operation?

A. Clarifying it; the pan is first filled with water to a certain height, and the sugar put into it.

Q. After that process, what quantity of sugar is put in to be boiled? A. Commonly a ninth part.

Q. To what depth will the pan be filled with that part?

A. I should think one-eighth, perhaps, of the whole contents.

Q. To what degree of temperature is the sugar carried for the purpose of crystallization?

A. From 235°, never exceeding 250°.

Q. Would it be prejudicial to your object, if you were to carry it beyond 250°? A. Certainly.

Q. Is it, therefore, part of your system to restrain the temperature within those limits? A. Certainly.

Q. Did you ever know an instance of sugar boiling over when it was going through the process for the purpose of arriving at crystallization?

A. Yes, certainly, when first put into the pan, I have seen it boil over when the solution was weak.

Q. In what stage of the operation was that?

A. In the commencement of the evaporating process.

Q. At what temperature would it be then?

A. Very little above 212°, I should think.

Q. Did you ever see an instance of that sort, after it had arrived at a higher temperature? A. No.

Q. Would it take fire at that temperature when it boils over?

A. If it were to run into the fire, it would become desiccated and take fire, but it cannot run into the fire, it would run over to this part of the pan, which catches any thing that runs over.

Q. It could not take fire till the water was dislodged?

A. Certainly not.

Q. That is the first part of the process?

A. At the commencement of the evaporating process.

Q. Did you ever know it boil over at any ulterior stage of the process? A. No, never.

Q. Now in that process, in the way you have been describing, do you consider there is any danger resulting from the operation of boiling? A. None whatever.

Q. In your judgment, what is the cause that renders a sugar-house a hazardous manufactory?

A. More particularly from drying the sugar in the stoves, and from the heat sent out from the chimney into the floors.

Q. In your judgment, is the mere operation of boiling the sugar attended with more danger than boiling so much water in one of those pans? A. No, I think not.

Q. You have seen this model before to day? A. Yes.

Q. You know this is a process for the purpose of boiling sugar by oil? A. Yes.

Q. In your judgment, would it be a more dangerous process than you adopted yourself?

A. Certainly, I should think so.

Q. Do you consider the boiling of oil more dangerous than the boiling of sugar? A. Certainly.

Q. In any mode of boiling which can be devised?

A. As far as I know.

Q. Then in your judgment, you should consider this a more dangerous process than that which is adopted by you?

A. Certainly, I consider the danger as none whatever, by the old practice.

*Lord Chief Justice Dallas.*—Gentlemen, considering the mass of evidence, it is desirable to adjourn to to-morrow I shall have to state all this evidence to you?

*Foreman of the Jury.*—Of course.

*Mr. Serjeant Hullock.*—Have you made any observation to

enable you to tell us whether the steam, which is emitted from the sugar-pans, always escapes by means of the steam-bin?

A. Not always, certainly.

Q. Have you known the contrary sometimes?

A. Certainly.

Q. And what has been the effect when it has not gone in that way.

A. The whole fill-house has been full of steam, so that you could hardly see your hand before you.

Q. To what cause do you ascribe that effect?

A. Certainly, to the weather.

Q. Has that effect, sometimes, existed for a length of time together?

A. For several days.

Q. And you know no other cause but the weather?

A. No.

*Mr. Solicitor General.*—That is, if the atmosphere is in a light state, and there is much steam, it will not go out?

A. When the atmosphere is loaded, it will not go out.

*Mr. Serjeant Vaughan.*—Nobody will dispute that.

*Mr. Scarlett.*—Then it is not disputed, when it is likely to rain in the morning, it will descend?

*Lord Chief Justice Dallas.*—Of course, when the air is saturated with moisture it will take up less steam.

ALEXANDER GARDEN, Esq. Sworn.

*Examined by Mr. POLLOCK.*

Q. You are, I believe, a practical chemist?

A. Yes.

Q. You were present at White-cross-street, when the oil was examined, which had been twenty-three days subjected to the temperature of 360°?

A. Yes.

Q. Did you see the results which have been stated by other Gentlemen?

A. Yes, and I saw the thermometer indicate a temperature of 360°; in a short time afterwards, it was raised to 410°, when it gave out a vapour, which appeared partially combustible, mixed with aqueous vapour; on raising it higher, it started out with considerable violence.

Q. Are you acquainted with the process of boiling sugar in the ordinary way?

A. Not in all its details.

Q. Have you heard it stated?

A. Yes.

Q. Can you form a judgment of the danger of the common process, and heating it by oil in the plan detailed in that model?

A. I should certainly think the process of boiling by oil, is, of the two, the most hazardous.

**Q.** Did you hear the account given by the two witnesses, who first stated, they saw the fire come out? **A.** Yes.

**Q.** Can you form any judgment, whether, it was possible for oil vapour, collected in the steam-bin, to produce the appearance they describe?

**A.** It is difficult to state it, without being acquainted with the size of the bin, and the quantity of vapour; but, if there was a large quantity of vapour given out, I should think it very likely to produce the effect.

**Q.** Does the appearance which they describe, correspond with what would be the case, if, as you have stated, a large quantity of vapour was given out?

**A.** I cannot say that, positively, because I have never seen any experiment on so grand a scale; and I think it would be very difficult to state what appearance it would really have, until I had seen it.

**Q.** Without being able to form a judgment, as to an experiment on so large a scale, are you able to form a judgment, of the comparative danger?

**A.** I have already stated, I should be inclined to consider, that the process by oil is, of the two, the most hazardous.

**ARTHUR AIKIN, Esq.**

*(Secretary to the Society for the Encouragement of Arts, &c. &c.)* Sworn.

*Examined by Mr. SCARLETT.*

**Q.** Are you the son of the late Dr. Aikin?

**A.** I am the son of Dr. Aikin, my father is alive.

**Q.** Have you ever attended to chemical pursuits?

**A.** Yes.

**Q.** Have you ever made any experiments upon oil?

**A.** I have, some years ago; I have not made any with a view to the particular question before the Court, but partly from my own views; and, with a view to a legal proceeding, I made some experiments four or five years ago. My experiments were chiefly applied to the composition of whale oil; I ascertained, that in its ordinary state, besides containing the proper oil, it contained, in solution, a quantity of gelatinous matter, similar to common animal jelly. I found that when this was boiled in a pan pretty rapidly, it burnt, in some degree, to the pan, as milk does, and distillers wash, and other articles, when they are subjected to the action of a fierce fire. I found, that in consequence of that, the oil became turbid and black, and that that was owing to the charring of the jelly which was contained in the oil, at least, that that was the first effect: now, it is a fact very well known to chemists, that if animal jelly is exposed to such a temperature as to

blacken it, it will be decomposed, and a quantity of very volatile inflammable oil will be given out. This oil was first discovered by a certain chemist of the name of Dipple, and it is hence known in the books, by the name of Dipple's animal oil. When this oil has been subjected to one or two more distillations, it then becomes more volatile, and more inflammable, and I have seen it in such a state, that when poured into the hand, it will evaporate from it nearly in the same manner as æther, or spirits of wine, and that vapour is very highly combustile. When viscid liquors, such as the common whale oil, are exposed to the action of naked fire, in an iron pan, or any other metallic vessel, the passage of the heat, from the fire to the upper part of the fluid, is retarded in proportion to the viscosity of the fluid and to the quantity of carbonaceous matter which it may hold in suspension; and in consequence of this, a thermometer dipping into the surface of the fluid, will be a very inadequate test of the temperature of the bottom of the fluid, so that the stratum at the bottom of the fluid may be in a state of high decomposition, and at a high temperature, while the thermometer at the top of the fluid, indicates a considerably lower degree of heat; on this account it is, that I think oil is a fluid, which is not adviseable to make use of to raise the temperature of other substances by, because it is apt to burn to the bottom of the pan, to be decomposed, and to have its temperature varying a good deal, between the bottom and the upper part of its surface.

Q. Did you form that opinion long before you heard of this case?

A. I formed the opinion from the experiments I made three or four years ago.

Q. From the experiments you have made, is boiling oil a substance that is of a dangerous nature?

A. From my own experiments I should conclude it to be dangerous, and from the very interesting facts Mr. Farraday has mentioned this morning, I should consider it much more dangerous than I was aware of at first.

Q. Then the opinions you formed three years ago, are confirmed by the facts you have heard of the experiments last Thursday?

A. Yes, very much.

Q. And not inconsistent with your experiments at all?

A. No.

Q. In fact, a portion of the liquid being decomposed, before the parts above, has produced different results?

A. Yes, it does, it is composed of an essential oil, or volatile oil; and therefore is inflammable, and is capable of ex-

panding to a hazardous degree, at a moderate temperature; therefore, unless there was a free opening for it to escape, there would be a great risk of the seams of the boiler giving way, and by that means of its becoming leaky.

Q. Am I right in supposing, that the decomposition in the stratum of the bottom, which would produce the volatile oil, would occasion it to be forced through the mass to the top?

A. Yes, distinctly so; I conceive the volatile oil as soon as it is formed, rises into the thick oil, and that, not being able to boil at a temperature to raise the volatile oil into vapour, it will form a vapour in the upper part of the boiler.

Q. From the experiment you have made yourself, did you observe whether that vapour was combustible?

A. Certainly, very highly combustible.

Q. I may venture to ask you, whether you know the ordinary mode of refining sugar?

A. Yes, I have attended at three or four houses to examine the process.

Q. You know the ordinary mode of applying fire to the pan? A. Yes.

Q. From your experience of the article, and acquaintance with the general manufacture, does the application of oil encrease or diminish the hazard?

A. I conceive boiling the sugar for crystallization in the ordinary way is attended with very little hazard. I do not think the original danger was much; but there is a good deal of additional hazard, in introducing to boil the sugar, a fluid which, I think, is so unmanageable and dangerous as oil.

Q. The danger of this process then, does not lie in the boiling the sugar, but in the boiling the oil? A. Certainly.

Q. From the heating the oil? A. Certainly.

Q. Is it consistent with your experience, as to the nature of this substance, that after being exposed to the action of a fire several times, it becomes more inflammable, and more easily brought to a given temperature, than in its fresh state?

A. Certainly, so I conceive, that after it has circulated in the way described for several days, the volatile part of the oil will by degrees become more and more volatile, till it will be reduced to Dipple's oil, in which case, it will be inflammable by the mere temperature of the hand.

Q. So that, in process of time, if this circulation of the oil, at from 360° to 400° was to continue, you think without a great application of fire, it would become combustible?

A. Yes, all that part of the gelatinous substance, which is converted into volatile oil will be changed. As to the effect,

upon the fat oil; I did not conceive, till I heard Mr. Faraday's experiments, that the result would have been similar on the fat oils; but now, I think, the whole will become volatile to a very considerable degree.

Q. In proportion as it becomes volatile, does the danger encrease of applying fire to it?

A. The more volatile it is, the more explosive it is; and, therefore, the more risk of tearing the boiler asunder, and there is a great risk of combustion, in case any substance in a state of inflammation happens to come in contact with the vapour on the boiler.

Q. Have you been in Court, and heard this machine, and this mode of conducting the vapour, arising from the oil, described? A. Yes.

Q. You are aware then, that there is a vent from the cauldron of oil, that carries an iron pipe up the steam vent?

A. Yes.

Q. And there the vapour escapes? A. Yes.

Q. In your judgment, and according to your experience, do you consider it likely, that at some time it may find its way into the steam-bin?

A. I conceive that the vapour itself, will probably not be sufficient to cause a current up or down, but will follow the current previously established, in consequence of the state of the weather, or the temperature of the house, so that if there is an ascending current, the vapour will go with it, but if there is a descending current, the vapour will descend with it.

Q. Have you known, that the state of the weather produces a difference in the state of the current up and down the chimney?

A. I have personal experience of it, for I have a chimney that carries down smoke, in a way very unpleasant to me.

Q. A south-east wind, perhaps? A. Yes.

Q. North-west it rises? A. Yes.

Q. Do you consider the danger is encreased by this process?

A. It is encreased; I consider the old plan very little dangerous, and the introduction of the oil, being unmanageable, is hazardous in the first instance, and the longer it is used, it is the more and more hazardous, and at length a very small circumstance, I should imagine, would produce an accident.

Q. Having heard the evidence, if you did hear it, of the two first witnesses this morning, who described the flame from the window, do you conceive that to be the natural result of the vapour, or any portion of the oil being in a state of conflagration?

A. If a quantity of vapour accumulated under wood, or any



thing of the kind, with a proper quantity of atmospheric air, it would take fire, the heat from that would rarify it very much; that would expand it in all directions, and as soon as the first blast was over, it would be reduced in its dimensions, in consequence of the cooling a column of the vapour which has been ignited.

Q. In your judgment, would it be the natural effect of that expansion, to pass through the window and rise up?

A. Certainly.

*Lord Chief Justice Dallas.*—Supposing it to pass through the window, would it be like what the two first witnesses have described?

A. I should imagine so, there must have been great expansion, and as soon as that was over, the flame would collapse and withdraw to the aperture from which it issued, and would flame upright; whereas before, it would go off nearly horizontally.

Q. Here is a gas light here, which is suspended very nearly under this bin; I will suppose, from any accident, a vapour was collected in this bin, and descended of a morning that was heavy, and the vapour were to come in contact with the gas light, do you conceive that the result would be such as the witnesses describe, an inflammation and a conflagration?

A. I think it is not improbable.

*Cross-examined by Mr. SOLICITOR GENERAL.*

Q. You mentioned that the oil with the application of heat, may be partly decomposed, the part immediately in contact with the bottom of the vessel? A. Yes.

Q. That must be by a considerable action of heat? A. Yes.

Q. Would not the effect of that be to pass off?

A. Yes: the first effect would be to rise from the hot part to the cooler part of the fluid; if the supervening fluid was sufficiently hot, it would pass off, otherwise it would remain mixed with it till it acquired a certain temperature.

Q. At what temperature would it pass off?

A. That would depend on the degree of the decomposition, because the result of the first distillation is to produce an oil not so inflammable as when it has been distilled two or three times, therefore it depends upon the degree of decomposition it has undergone.

Q. Suppose the part decomposed to be floating in the mass, how will it be distilled again?

A. Being mixed with the general mass, and therefore part of it being mixed with the oil which forms the bottom stratum, that portion which has been distilled would come again

to be distilled, then it would pass off at a lower temperature than before.

Q. Therefore it would pass off?

A. After the process had gone on a certain time, there would be a constant giving off of this oil, in a state of vapour.

Q. That would pass off as it was created?

A. Yes, while the oil was remaining at a pretty high temperature, but in proportion as the oil cooled, then, I should expect that this inflammable, highly evapourable vapour, would remain mixed in the oil, and encrease as the oil cooled.

Q. The first distillation it might not pass off, but coming again near the bottom, it would have the operation repeated, and then have activity enough to pass off, so that this would pass off successively as created?

A. A portion of it would.

Q. Would it require a considerable heat to effect this decomposition? A. Yes.

Q. What temperature?

A. A temperature sufficient to char the substance.

Q. What do you estimate that temperature to be?

A. I can scarcely tell what it is; the temperature which evidently exists at the bottom of pans, in various cases, is very great, while the thermometer at the upper part of the fluid indicates a low temperature.

Q. What temperature would be required according to your judgment?

A. I have not made the experiment.

Q. If the mass of the oil is kept in motion, it is less liable to this than if it remains quiescent. A. Yes.

Q. Perhaps, by keeping it in motion, that effect would be obviated, or nearly so?

A. It would be retarded, as the distillers put iron chains into the bottom of their boilers, to scrape the rust from the bottom, without which the contents of the boiler would be charred, the bottom of the boiler would melt out, and the use of these chains is to keep it clean.

Q. Any thing that kept it in motion would prevent this, or obviate it in a great degree?

A. It would prevent it in a degree.

Q. This is much more likely to pass off and explode, at a high temperature, than a lower one?

A. It is necessary to give some explanation as to that: while the oil is at a certain high temperature, the greater part of the inflammable oil will be passing through the super-incumbent mass of oil; but when the oil is cooling, a lower temperature is adequate to the formation of this volatile oil, when it has been once rightly distilled.

Q. I ask, as to its leaving the mass and going off as vapour?

A. In proportion as the oil cools, this volatile oil will accumulate in the oil, so that after it has been allowed to cool, and is again raised to a considerable temperature, I should expect there would be a considerable gust of this volatile oil on the first application of the heat.

Q. You have attended to the apparatus that is there?

A. I have seen the model of it.

Q. If a vapour is created on the surface of the fluid, would that impede the operation of the pump?

A. No, I do not think it would.

Q. It would have no effect?

A. I do not conceive it would.

Q. Has this excessive operation the effect of producing any alteration in the appearance of the oil itself?

A. Yes, it will get more and more black, which will be a more accurate indication of the quantity of volatile oil that has been produced, and the temperature it has been exposed to, than the thermometer, because the thermometer only shews the temperature of those parts nearest to it.

Q. The blackness of the oil will not be an indication of the quantity of oil that remains? A. No.

Q. Does it also become considerably thicker?

A. Certainly it does: when *cold* it becomes actually *solid*.

Q. But when heated again considerably, it becomes again fluid?

A. Yes, only in proportion as it becomes black it becomes turbid, and is less capable of passing easily the heat which passes into it from the bottom.

Q. Can you tell us as to the quantity of this volatile matter that is produced?

A. No, I cannot; it depends, in some degree, upon the different kinds of whale oil, some samples contain more jelly than others, but they all contain a considerable portion, but the south whale oil contains less than the other oil, but all the samples of whale oil contain a considerable portion of jelly.

Q. But some contain it in larger proportions than others?

A. Yes: I cannot say the proportion, but all of them contain it in a considerable quantity.

*Re-examined by Mr. SCARLETT.*

Q. Have the goodness to look at that?—(*a pot of oil.*)

A. I should expect this was oil which had been exposed to a high temperature, and in which the jelly and adhumous part is considerably charred, and the oil is fouled; and I think it would transmit heat more slowly than previous to

the thickening and blackness of it; the heat will accumulate more at the bottom.

*Lord Chief Justice Dallas.*—That at the bottom becomes much hotter than that at the middle, and on the surface, therefore a thermometer at the surface will not indicate the heat at the bottom, and that which is in the bottom will not rise in vapour to the top, as it would in water; in boiling water the heaviest goes to the bottom, and the other rises, that would not be the case in oil?

A. Your Lordship has explained what I mean, the more limpid it is, the more it will transmit heat. It has been proved by Count Rumford and other chemists, that the transmission of heat is retarded by its being solid.

*Lord Chief Justice Dallas.*—Count Rumford said, fluids were non-conductors of heat; that is exploded, but they are said to be slow conductors of heat? A. Yes.

*Mr. Scarlett.*—Will your Lordship allow me to ask him a question. The Solicitor General has asked you, whether the effect you have spoken of, would take place when the pump was going—

*Mr. Solicitor General.*—No; I had been told that vapour on the surface of the fluid would obstruct the pump, and I meant to found another question on it, but it was negatived.

*Mr. Scarlett.*—When the pump was going, would the danger be greater, or before the pump was set to work?

A. When the pump is at work, of course the hot oil is made to circulate in the serpentine tube which passes through the boiler in which the sugar is placed, and it will give all the heat that it gives out to the sugar, as subtracted from the oil itself, and there will be less danger of an extraordinary quantity of heat accumulating in the oil boiler, while the pump is at work.

Q. Then, in your judgment, the most dangerous period of the process, is that in which the oil is brought to its state of heat, and just before the pump begins to work?

A. Yes, and more especially if the oil had been allowed to cool, previous to its being hot; because, by the cooling, there is a quantity of this volatile oil detained in the mass, which there is not heat enough to cause it to flow away.

Q. Supposing it to have been heated the day before, till seven or eight at night, and then to cease, and to lie till two or three in the morning, and then the party to heat it again; in your judgment, would that period of the heating process, before the pump began, be the most dangerous period?

A. I should think so.

Q. So that, if the engine had not been set in motion, to set

the pump at work, and this fire was going on to heat the oil, that would be just the most dangerous moment?

A. Certainly.

*Mr. Scarlett.*—[*To Mr. Christopher.*]

Q. That pot belonged to you once?

A. Yes: [*A Jurymen.*—Willoughby and Clayton will remain in court.] This was used six times; it came out of the pipes, the other came out of the boiler.

Q. This was what was used, in Mr. Wilson's presence, at Craven and Bowmans? A. Yes.

Q. And that was six times heated?

A. Yes, and when the pipes came out, I caught it.

*Mr. Solicitor General.*—Was it mixed with the sugar?

A. No.

Q. You said it mixed with the sugar sometimes?

A. Yes, but this came out of the pipe; when it was taken out, we were obliged to break the joints of the pipes to take them out.

*Foreman of the Jury.*—The Jury are desirous to know the nature of this burst of fire, and the colour of the flame?

*Lord Chief Justice Dallas.*—[*To Samuel Willoughby.*] When the burst of flame came out of the window, was there any thing of peculiar smell? A. Not that I found.

Q. What was the colour of the flame?

A. I cannot tell, any further than the usual fire, the colour of the usual fire; no particular colour, that I took notice of.

Q. It gave you no notion, except that of common fire?

A. No.

*A Jurymen.*—How near were you, when the flame burst out?

A. I suppose I was, from twenty to thirty yards, I cannot say to a few yards; but near upon that: I may say thirty yards, as near as possible.

*Lord Chief Justice Dallas.*—[*To Clayton.*] When you first perceived this fire coming out of this building, what was the colour of the flame?

A. It was rather of a reddish colour, the same as any common blaze.

Q. Did it strike you as different from common flame?

A. No, not much difference.

Q. Did it strike you there was any difference?

A. No, I did not perceive any.

Q. Did you perceive any particular smell?

A. No, I did not.

The Court then Adjourned at six o'Clock, P. M.  
till to-morrow at ten o'Clock.

### THIRD DAY.

*Mr. Serjeant Blossett.*—Will your Lordship allow me to ask one question of our chemists; and it is, whether, supposing the fire——

*Lord Chief Justice Dallas.*—Do you mean, of all your chemists?

*Mr. Serjeant Blossett.*—No, one or two; whether, according to their judgment, supposing the fire broke out in the manner our two witnesses described in the street, any man coming up the street, at that distance, was at all likely to have smelt any peculiar smell.

*Lord Chief Justice Dallas.*—Certainly, that was what the Jury asked last night.

*Foreman of the Jury.*—It is very important to us; and we hope your Lordship will excuse us, if we have any doubts to remove; there are some parts of the evidence upon which we wish to receive further information, and we should wish to examine the engine-keeper.

*Mr. Solicitor General.*—That is May.

*Foreman of the Jury.*—And one of the scientific men.

*Lord Chief Justice Dallas.*—Gentlemen, you have given the question a degree of patient attention seldom equalled, and impossible to be excelled; any witness shall be called back; it is quite right to get all the light you can on a subject more or less mysterious—more than that, I say nothing.

*Foreman of the Jury.*—Doctor Bostock says, the subject is new, and full of conjecture.

*Lord Chief Justice Dallas.*—Yes, and he has greatly considered this subject, as well as fire, electricity, and a number of others.

*Mr. Solicitor General.*—The Jury and your Lordship will take it into your own hands, because the defendants have closed; and to recur to this over and over again is not correct: a consultation takes place at night, and this is thought necessary.

*Mr. Serjeant Hullock.*—You might have had a consultation last night—we had none; and if we had, there would be no impropriety in our application.

*Mr. Serjeant Blossett.*—We wish to call Mr. Farraday.

*Mr. Serjeant Lens.*—Is there any thing new, which has not been put before?

*Mr. Serjeant Blossett.*—Your Lordship will put the question.

*Lord Chief Justice Dallas.*—The Jury wish to do it.

*A Jurymen.*—[*To Mr. Farraday.*] You have said, that there was a volatile oil produced from the vapour-pipe, when the oil was in a certain temperature?

A. Not a volatile oil—a volatile inflammable vapour from the pipe.

Q. I thought you said, a volatile oil?

A. I said, it was obtained from the oil heated in the retort, and from the same oil, at the same temperature, came the inflammable vapour.

Q. But none of the oil which you shewed, was produced there?

A. It was not condensed there, though it was my opinion the vapour was the vapour of that oil, which we obtained at a lower temperature from the same oil in the retort.

Q. Would that vapour, if fired, have exploded?

A. It would, or have burnt more or less quietly, in proportion to the mixture of air with it.

Q. It must have been in considerable quantity to explode?

A. It must have been in a certain proportion to the air with which it was mixed, to explode, or it would not have exploded.

Q. What proportion?

A. With regard to the proportion of the vapour to the air, I cannot speak; but I can make a judgment from other experiments, if you will allow it; with a gas, which appears to me nearly as inflammable, it requires a fourteenth part, at least, to the air, to be explosive, and I will assume, or suppose, that about the same proportion of this vapour would also form an explosive mixture; but it is merely a judgment from analogy.

Q. What vapour—the vapour from the pan?

A. The vapour of the oil, which we obtained at the temperature of 410°.

Q. Would the explosion, in that case, resemble the explosion of gunpowder? A. No.

Q. Not so violent?

A. No, the explosion of gunpowder is violent in the proportion of the volume of the gases produced to the volume of the gunpowder, which is very great; many hundred times, many thousand times, combined with the rapidity of the inflammation: the explosion of gases may be generally considered in the same way, the proportion of the heated gas, to the proportion of the gas before it was fired; may I ask to hear what I said, I think I said, heated gases before they were fired. I mean cold gas.

*Lord Chief Justice Dallas.*—I will read it: the explosion of gunpowder is violent in the proportion of the volume of the gases produced, to the volume of the gunpowder, which is very great; the explosion of gases, may be generally in the same way.

**Q.** That is the proportion of the heated gas to the vapour before firing?

*A Juryman.*—Would the explosion, if such took place, be of a bursting nature?

**A.** Yes, it would rapidly expand; when the vapour is raised, as it necessarily is, by an inflammation throughout its whole extent, to a heat of more than redness, it occupies three times the space it did before; and the explosion is in that proportion; there is an expansion in every direction to that extent.

**Q.** If this vapour exploded in that manner, would it emit any smell?

**A.** All the vapour exploded, would have its smell destroyed; the smell belongs to the vapour, and not to the products of the vapour, the smell of the vapour is essential to the vapour, when it is exploded it forms other substances.

**Q.** In the oil you produced yesterday, and inflamed, there was a considerable smell, which we perceived? **A.** Yes.

**Q.** Was that of the same nature?

**A.** It was from the vapour that rose from the oil.

*Lord Chief Justice Dallas.*—Would all vapours exploded, have the smell destroyed?

**A.** It would have the smell of the vapour destroyed, because the products of the explosion have other properties than the vapour exploded.

**Q.** Do you mean it enters into new combinations?

**A.** Yes, with the air with which it explodes.

*A Juryman.*—Would inflammable gas, produced in the same manner from oil, produce nearly a similar effect; in case of explosion, would inflammable gas, produced from the oil, in a high temperature, have nearly the same effect, in case of explosion, as the vapour you have mentioned?

**A.** I should expect it, from the rough experiments I have made; in all the cases where I have exploded the mixture of the vapour of the oil, with the vapour of the substance. You saw the appearances were nearly similar, but their appearances are modified by circumstances, so that you can make one more bright than the other in turn.

**Q.** Would the gas, exploding in that manner, emit any smell? **A.** Not if burnt.

*Lord Chief Justice Dallas.*—Would not there be some smell?



A. From these portions of the vapour not burnt, but not from the portion burnt, at least, not a smell of the vapour.

*A Jurymen.*—Suppose a house blown up with such a vapour, would not the passengers smell it?

A. If there was any part of the vapour not exploded, that part would be thrown about by the explosion of the other parts, and smell.

Q. You think there would be some smell?

A. It depends upon the circumstances, that there is some part of the atmosphere, not containing sufficient proportions of the air, or vapour to explode.

Q. In case of explosion, of either the gas or the vapours at that high state of temperature; what colour would the fire or explosion be of?

A. It would be a bright flame, the flame of a candle I should expect.

Q. Not a blue flame?

*Lord Chief Justice Dallas.*—It would be more like the flame of a gas-light?

A. It would depend a great deal upon the proportions in which the mixture is made; if a small proportion of gas, or vapour, is fired with a large proportion of the air, the flame is blue, speaking of the vapour already under consideration, as you observed, in fact, once or twice in the bottle, it was blue; but, if the proportion of the vapour is larger than already assumed, and it be somewhat confined, that has an effect, and the flame is somewhat more bright; but, independent of that, the flame is more bright, the colour of the flame will vary, from the palest blue to the brightest gas-light; in fact, the gas-light is a continuous explosion of the gas, in the highest proportion with the air, and therefore, it gives you an instance of the colour of the explosion, at the brightest point.

Q. You think, in the phial, there was more air than vapour?

A. No, there was too much vapour; if that is diluted by air, it will diminish the colour of the flame; the colour is brightest when the proportions are best mixed for combustion.

Q. It would be much more easy to inflame the vapour in the phial, than to inflame the vapour in the bin?

A. In either case it was equally difficult; the flame would not descend into this phial, because there was too much of the vapour.

Q. Was all the vapour that was in the phial consumed?

A. Yes.

Q. How do you account for the smell?

A. Because the bottle was open before I put the flame to it, and afterwards.

*A Juryman, [To Mr. Parkes.]*—You have heard the questions that have been put to the last witness? A. I have.

Q. Do you concur in all his answers? A. I do not.

Q. In what respect do you differ from him?

A. Particularly respecting the smell.

Q. Have the goodness to state the difference?

A. I do not recollect ever having witnessed an explosion of gases without smell; I do not mean to say that that is not so, but I do not at present recollect any instance.

*Lord Chief Justice Dallas.*—What is the smell that is produced by a thunder-storm? it is generally imputed to supposing rain produced by the two gases meeting, and in a thunder-storm there is generally a smell and an explosion?

A. Generally: I have thought that that has arisen from nitrous gas.

Q. Still there is an explosion there?

A. Yes, and a smell. I believe it is generally the case in explosive mixtures, that the whole of the gas does not explode, and, consequently, that portion that does not explode, must retain its original smell, and that smell must be driven about the neighbouring parts, and throughout the atmosphere.

*A Juryman.*—And retains its original smell?

A. Yes. I have made no experiments respecting the colour of the gases, when mixed with different proportions of atmospheric air, and therefore am not able to speak to that point. Mr. Farraday may be very right, for all I can say, as I have made no experiments.

Q. There is an inflammable vapour, we understand, which would be generated from oil at that high state of temperature, at 410°?

A. I do not understand that; I could not produce that, neither do I believe that an inflammable vapour could be produced from whale oil at that temperature: my own opinion is, that there must be some mixture with that oil. I do not mean to impute any thing impure to Mr. Taylor, no gentleman can stand higher in the public estimation than that house does, but it occurred to me, that it behoved those gentlemen to shew from whence the oil was produced, and that it was pure, because I have been consulted upon the purification of animal oil.

*Mr. Serjeant Hullock.*—I beg leave to interpose.

*Lord Chief Justice Dallas.*—It rests with the Jury, and it is for their own information.

*A Juryman.*—You know there is a gas produced from oil?

A. There is.

Q. And a gas which is inflammable at a high temperature?

A. Yes.

Q. In the apparatus which you see, and in that chimney, or flue, which is intended to convey away the vapour, and into which there is a pipe leading from the oil vessel; supposing that an accumulation of gas had taken place in that flue, of any description, could you suppose it could be of such a nature as to explode, or in such quantity as to explode?

A. Which chimney do you allude to?

Q. Where the leaden pipe is, and coming down to the gas-light.

A. If I have understood the explanations which have been given, of the manner of conducting the apparatus, there must have been considerable heat in that oil vessel; now it does appear to me impossible, absolutely impossible, that that oil vessel containing an 100 gallons of oil, heated to from 350° to 400°, should have been heated so many hours, and left at that point, or perhaps higher, without producing a constant current up that vent; to which must be added, the heat of the sugar-house, for I understand these chimneys had dampers, which opened into all the floors, consequently in the night when the house was shut up, it must have been very hot, and there must have been a draft up all the flues. In my estimation, and from that view of the subject, I conceive it impossible, that inflammable gases could have remained in that steam-vent, they must have gone into the atmosphere as they were generated.

Q. Supposing the accumulation of such gas as has been described, to take place in the flues, or in the premises below, where the light was, so as to have occasioned an explosion, would that explosion have been similar to that of gunpowder, or in what degree?

A. I do not know what experiments other gentlemen may have made on the subject.

Q. Did you ever see such an explosion?

A. I have seen explosions of carbonated hydrogen gas with atmospheric air, and I never knew any such, without tremendous noise; I do not conceive it possible, there could be an explosion of that sort without tremendous noise, a noise that would have been heard, throughout the whole neighbourhood.

*Lord Chief Justice Dallas.*—Is the noise owing to the quantities of air displaced?

A. By the displacing of the atmospheric air; I conceive, it must have been heard for miles around.

*A Juryman.*—Is there a strong smell from the explosions you have heard?

A. I have never witnessed a large explosion, but I have always found a smell, and a very offensive smell.

*A Juryman, [To Mr. Brande.]*—You have heard Mr. Parkes's evidence just now? A. Yes.

Q. Do you concur with him?

A. In the principal parts I do concur.

Q. In what respect do you differ?

*Mr. Serjeant Blossett.*—Mr. Scarlett being in the other Court, I should be much obliged to your Lordship, to allow me to send for him. I do not wish to oppose any wish of the Jury.

*A Juryman.*—We only wish to arrive at the truth.

*Lord Chief Justice Dallas.*—No doubt of it gentlemen; and all these enquiries ———

*Mr. Taylor.*—I hope the Jury will have the goodness to ask me a question or two, an imputation was made, conceiving I was guilty ———

*Lord Chief Justice Dallas.*—Do not interrupt now, you shall have a full opportunity of explaining it.

*Mr. Parkes.*—I beg to be allowed to rebut that, because I premised that there could be no possible imputation upon him.

*Lord Chief Justice Dallas.*—He had every reason to believe it genuine oil; you say, no person can stand higher than Mr. Taylor: whether oil is really genuine may not be known to the person, but Mr. Taylor will be heard on the subject.

*Mr. Taylor.*—I only wish simply to state the fact.

*Mr. Serjeant Blossett.*—I beg the examination may stand over till Mr. Scarlett comes.

*Lord Chief Justice Dallas.*—Send for Mr. Scarlett.

*A Juryman.*—Our motives are well understood by your Lordship, I am sure.

*Mr. Solicitor General.*—We do not interpose; Mr. Scarlett cannot attend, I understand.

*Mr. Serjeant Blossett.*—Then your Lordship will allow me just to state this injustice to my clients, and my own feelings. I do not interrupt the course that is pursuing, but I wish to suggest to your Lordship, whether it will not be more just to both sides, after having put these questions to this gentleman, to put the same questions to other witnesses on the other side.

*Mr. Serjeant Vaughan.*—Oh, dear! no!

*A Juryman.*—We have tried that, we have selected one on each side.

*Lord Chief Justice Dallas.*—The Jury will judge of the course they will pursue.

*A Juryman.*—We will do without Mr. Brande.

*Mr. Serjeant Vaughan.*—It is out of our hands, and in the hands of the Jury.

*Mr. Serjeant Blossett.*—I am safe in your Lordship's hands, and the Jury's hands, but not in the hands of a witness who enters into an immense field of particular feelings of his own.

*Mr. Serjeant Vaughan.*—This is an observation on the testimony.

*Lord Chief Justice Dallas.*—Brother Blossett, you must see all this enquiry, except the questions put by the Jury, originates with yourself: the case was closed yesterday, and now you propose to call a witness, and therefore it was an indulgence to you; but if we are to go to the other witnesses, that is trying the cause over again. At the same time I will add, that it is a proper anxiety on your part, in the absence of Mr. Scarlett, who led the cause; you have my approbation in having proposed what you have done, but you cannot call back all the witnesses in that way. The Jury will consider what is administering justice, and call back any persons they please.

*Mr. Serjeant Blossett.*—If I am understood, my Lord, I am perfectly satisfied.

*A Juryman, [To Mr. Brande.]*—Will you state in what you differ from Mr. Parkes?

A. I think he stated, in all cases of the burning of inflammable air, there must necessarily be an explosion.

*Mr. Parkes.*—Mixed with atmospheric air.

A. Certainly.—I beg pardon, I misunderstood; mixed with atmospheric air, I should conceive there would always be an explosion.

*Lord Chief Justice Dallas.*—Then you agree with Mr. Parkes in that?

A. Yes, in what I recollect.

*A Juryman.*—Do you differ in any other respect?

A. No.

*Lord Chief Justice Dallas.*—He does not differ at all.

*A Juryman, [To Mr. Philips.]*—You have heard the evidence of Mr. Farraday, Mr. Parkes, and Mr. Brande?

A. I did not hear the whole of Mr. Parkes' evidence.

Q. In case of an explosion, arising from vapour produced from oil at a high temperature, would any smell be emitted from it?

A. I conceive that there might be some smell, but not the original smell of the gas. When carbonated hydrogen, that is the gas burnt in the street, escapes, and is not burnt, there is a smell; but, after it is burnt there is no smell, at least no perceptible smell; and I conceive the same law would be applicable to the burning oil vapour.

Q. Do not you think that some vapour would escape when the rest was burnt?

A. Not if they were in contact—I cannot conceive it possible—because that which would cause the combustion of one part, would cause the combustion of the other part, and, consequently, there would be no original smell arising from the vapour or gas, from that explosion.

Q. Would there be any noise attending such explosion?

A. That has been so fully explained by Mr. Farraday, I cannot add any thing to it; I think it would depend upon the mixture. May I be allowed to make one observation to rebut any insinuations that have been made with respect to the adulteration of oil: different experiments have been made by different gentlemen, under different circumstances, and if there was any adulteration, it was as likely to be so in the other case of this concern, as in the experiments we made.

Q. In the application of such vapour, under such circumstances, before it exploded, would it emit any smell?

A. Unquestionably, I think so.

Q. A strong smell? A. I think a strong smell.

Q. Similar to that we smell in the street?

A. No, not so powerful as that, I think; but it is difficult to measure, because a great deal depends upon the quantity.

Q. If gas is produced at that high temperature, in the same manner, understanding that gas and vapour are different, would the same effect be produced upon gas, as upon the vapour?

A. That must depend upon the quantity of mixture with atmospheric air: do you wish to ask any questions as to the density of the explosion?

Q. How would it explode?

A. With considerable noise I conceive; but that would depend, as Mr. Brande has explained, on the quantity of atmospheric air mixed with it.

Q. But, in order to any explosion, there must be a due quantity of atmospheric air?

A. Yes, but it would depend upon the proportion of the two gases.

Q. There must be some noise?

A. Most unquestionably, I think there must be some noise.

Q. Would such gas, in such explosion, emit a strong smell, or any smell, after the explosion?

A. I should conceive not after the explosion, for the reason already stated, that is, that the burning of a gas lamp is a series of explosions, and after the first explosion is over, or while it is going on, no smell is perceived.

Q. Soon after you got there, you called down to know whether Muller was ready?

A. Yes, from the warehouse floor, I called down the steps to know if they were ready.

Q. At what time was that?

A. It might be a quarter, or twenty minutes after three; I cannot state to a minute.

Q. How long afterwards, as near as you can guess, was it that you set the pump to work?

A. I did not set the pump on at all any morning.

Q. The alarm of fire took place immediately?

A. No, I went across the mill-room again.

Q. At what o'clock was that?

A. About ten minutes after, or a quarter.

Q. Five-and-thirty minutes past three?

A. It was not the half-hour.

Q. Was it at that particular period, that you heard the alarm of fire first?

A. I started the engine before I heard the alarm of fire.

Q. When did you hear the alarm of fire, how soon afterwards?

A. It might be as much as five or ten minutes, or a quarter of an hour, I cannot positively say; I started my engine, and came down the yard from the engine-house.

Q. When you heard the alarm of fire, it would be then probably three quarters past three?

A. Yes, more than that, it might be full that.

Q. When you heard the alarm of fire, you proceeded across the mill-room? A. Yes.

Q. What did you do then?

A. I went right across to the iron door, I pulled that to my left.

Q. Were not you upon the floor above, the machinery below; you were on the floor where the pump is?

A. Yes, I was on the warehouse-floor, I was never down in the fill-house at all.

Q. Did you see the gas-light lighted at all?

A. No, I did not go below at all.

Q. What door was it you opened first of all, into the long-house?

A. An iron door, that opened out of the mill-room, into the long building.

Q. You pulled the door with your left hand towards you, you state? A. Yes.

Q. You saw the fire?

A. I saw a deal of fire and smoke, on the floor on the left of me.

Q. Observing the pump work there, where was the fire?

A. It was to the left of me; I stood as I stand now.

Q. Put your hand on the floor?

A. When I pulled the door to the left, the fire lay on the left.

Q. Whereabouts was it?

A. It lay more here [*pointing in a direction towards Union-street,*] when I came in, I came nearly opposite to the pump, the fire was to the left of me.

Q. Where was the fire? A. This way.

Q. That is nearly opposite the further window?

A. It was on the left when I came in, the chimneys were nearly opposite the door, and the fire was on the left.

Q. The fire was nearly opposite the second window?

A. I cannot say that, for I did not stop long.

Q. When you saw the fire first, did you smell any thing particularly strong?

A. Not any thing at all, no more than usual in any other fire.

Q. The smell produced by the fire, seemed to be of no other description than the smell produced generally by combustible matter, such as wood.

A. No more than any common fire.

Q. Was there any particular colour?

A. No more than I ever saw at any other fire, and I saw the Albion mills on fire, and was at it.

Q. When you saw it first, either before or after, did you hear any explosion or bursting noise?

A. Not any at all; I was not above a yard from the door of the engine-house when I heard the alarm, and I heard no noise whatever.

Q. When you opened the door, did you hear any thing?

A. No.

Q. Did you go afterwards out of doors?

A. Afterwards, not before.

Q. Did you see the fire at any particular window?

A. No.

Q. When you entered the warehouse, could you see the large window?

A. No, nor did I stop to look, but made the best of my way out.

Q. You state the fire not to have been of a bursting nature, like explosion? A. No.

Q. It was a strong fire, I suppose?

A. Yes, it was extremely rapid.

Q. It spread rapidly?

A. Yes, I did not stop to look any more, I went to open



the cocks, and get my engine out, and likewise stop the steam-engine.

Q. It spread rapidly, but not immediately, and without any bursting noise? A. Not any burst at all, certainly.

Q. When you went the second time to ask Muller if he was ready, did you perceive any smell then?

A. Not at all.

Q. When you entered the long-room, it was then about three-quarters past three, by your account?

A. Yes, I cannot say to a minute or two.

Mr. Scarlett.—Will your Lordship allow me to beg a question may be suggested to the Jury?

Lord Chief Justice Dallas.—We have not interfered on either side.

A Juryman.—Was there a fire under the oil boiler?

A. I did not go down.

Mr. Scarlett.—The Jury are under a mistake, about that iron door, and the machine.

A Juryman.—Where was the iron door?

A. It opened opposite the chimneys.

Q. Where is the iron door?

A. The pump is rather to the right—I leave the pump on the right.

Q. Is it about half-way between the door and the window?

A. The door that opens to the right, opens opposite; the other opens more to the left hand.

Q. The iron door is on the left of the pump?

A. The door opened with a pulley, and opened on the left of the pump; and the fire was to the left—what I saw of it.

Mr. Serjeant Hullock.—This model has been proved by Mr. Lockie to be accurate.

Mr. Scarlett.—And that the doors were over each other, has been proved by three witnesses.

A Juryman.—Where is the iron door, is that nearly opposite the pump?

A. The right-hand door was nearly opposite the pump, and the other was to the left.

Mr. Serjeant Hullock.—This was sworn to by Mr. Lockie, as being correct. [*Pointing to defendants model.*]

Lord Chief Justice Dallas.—It was a sort of case, in which it would have been extremely advantageous to have had a view.

Mr. Serjeant Vaughan.—They are down.

Lord Chief Justice Dallas.—It would have shewn the situation of the spot; that applies to one side as well as the other.

Mr. Le Blanc.—There is not enough left to shew the situation of the upper floors.

*A Juryman.*—The gentlemen for the defendants think it most satisfactory to hear both sides; therefore, we may as well ask Mr. Lockie the situation of the door. [*To Mr. Lockie.*] You are perfectly acquainted with these premises?

A. Yes.

Q. Can you point, exactly, the place on that model, where the door was?

A. This door would be upon the left hand of a person going out of the grinding-house into the long-house.

Q. Point it out, with your finger, upon the floor?

A. The iron door would be, according to this scale, far away from it. I will explain it here, [*the small model*]: the lower iron door in the grinding-house—

Q. We want the iron door opposite the pump—is it opposite the pump?

A. It is not opposite to a person going in at the door, the pump would be on his left hand. I mean to say, that a person going in at the door, the pump would be on his left hand.

Q. Then, in case that was so, the window would be opposite to him?

A. It would be more nearly opposite to him than the chimney.

Q. The light of that window would fall directly on him?

A. I do not know that it would be exactly opposite.

Q. You have gone in at the door, and seen through that window on entering it?

A. I cannot charge my memory with it.

Q. It would be natural you would see the window, if it was opposite?

A. A person so circumstanced would see it.

Q. Recollecting the situation of the pump—you would recollect the situation of the window?

A. The pump was put up after I saw the premises; but I know that the chimneys are the same.

Q. That pump is to the right of the chimneys?

A. So it is.

*Another Juryman.*—It is quite clear Mr. Lockie does not know any thing about it.

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## REPLY.

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MR. SOLICITOR GENERAL,

May it please your Lordship—Gentlemen of the Jury.

I beg leave to thank you, in the name of my clients, and I think I may say in the name of the public, for the very anxious and painful attention which you have given to this enquiry; and what we have just now witnessed, is a practical illustration of the admirable institution of the trial by Jury. The enquiry that has just been pursued, after the counsel on both sides had terminated the case, for the purpose of removing any doubts that might exist in the minds of any of those who were to decide upon the merits of the cause, by calling the witnesses one by one, before the judges who are to decide it, is, I repeat, a practical illustration of the excellency of this mode of trial; and, it is impossible not to feel happy at living in a country, and being a member of a community, where questions of civil rights between parties, are to be decided in this manner, and by a tribunal so constituted.

Gentlemen, you have been told by the counsel on both sides, by my learned friend, as well as myself, that this, as far as it relates to the interests of the plaintiffs on this record, is a most important subject of enquiry; for after they have taken every care, and paid every attention which it was in their power to do, as honest, and as liberal, and as upright men, to secure their interests according to the laws of the country; after they have paid that large premium, amounting, as you have it in evidence, to nearly three times the amount of what is a doubly hazardous insurance, for the purpose of screening themselves from the consequences of a casualty of this kind, to a degree at least, (because, if they succeed in these actions, their individual and private loss in consequence of what they must sustain, will be heavy and very considerable,) it must be a most grievous disappointment to them, if after taking all these pains, and having done what they thought necessary to indemnify themselves, they should find that all their care had been unavailing, and that this grievous and terrible loss must fall individually upon themselves, and not be shared by those who, they thought, had undertaken to support it. But, Gentlemen, grievous as the loss will be, I admit that if there is any rule of law, or any uncontrollable acts in this case, which call upon you to come to such a de-

cision, sworn as you are, to do justice between these parties, you have no alternative, but you must decide against them; but then, this I know, knowing who it is that I am now addressing, that you will not come to such a conclusion, upon vague theory, or upon conflicting speculation; but you will require such facts to be established by evidence so distinct, so conclusive, and if I may use the expression, so demonstrative, as to leave no doubt upon the mind of any rational man.

Gentlemen, let me for a moment direct your attention to the conduct of these gentlemen. I confess, that when a question was put to Mr. Lockie, and was answered in a particular way, although I had the utmost confidence in the integrity and honour of the gentlemen whom I represent, *the equivocal answer* he gave to the question, created some sensation of apprehension in my mind. I knew what was the import of that answer, I knew the situation in which that gentleman (Mr. Bishop) stood; and I therefore knew, that if the question was probed to the bottom, it would be found that it had the meaning which was ultimately given to it; but as to my learned friend, Mr. Serjeant Lens, who cross-examined that individual (Mr. Lockie), his duty had expired; the answer came out in reply to a question put by my learned friend Mr. Scarlett, and we had no opportunity of clearing up the doubt; it, however, did fortunately occur to one of you, gentlemen, to put a question for the purpose of explaining the bearing and meaning of that answer; and it turned out, that Mr. Bishop, having been trusted by Mr. Wilson with what was considered a valuable and a most important secret, was desirous that the particulars of that secret should not be disclosed; not to the office, as an insurance office, but that it should not be disclosed to particular individuals standing high in the management of the office, who were themselves engaged in similar pursuits, being sugar-refiners, and carrying on the business by another process; the answer was given with that view, and Mr. Lockie, to do him justice, directly liberated my client, Mr. Bishop, from any suspicion of any unworthy motives, from having been desirous of any concealment, for the purpose of practising any thing like a fraud upon this institution. Gentlemen, Mr. Bishop, and those who are connected with him in this cause, are incapable of any thing of the kind; such an issue might have been taken on the record, it has not; and my learned friend Mr. Scarlett, as counsel for the defendants, has himself, in strong and emphatic terms, paid the highest tribute to the integrity and honour of the plaintiffs.

Gentlemen, let us see, then, the situation in which they

stood ; in this room, to which your attention has been directed, a considerable time before this policy was effected, there were three fires and three sugar-pans in operation, one of these was converted, in the month of August last, into the boiler now before you ; the consequence was, that instead of the three fires, only two were used from that period ; and they thought and considered, and I think they were justified in considering, that the process which they had introduced had no effect or tendency whatever in encreasing the risk and hazard of this particular manufacture. That they did so consider, I think is most evident, because, in this building, connected with the other buildings, there are works in which there is property to the extent of upwards of one hundred thousand pounds embarked, a part only of which is insured ; and the remainder belonging to themselves. It is impossible to suppose, if they had considered they were encreasing the hazard of this establishment, that they would have put thirty or forty thousand pounds of their property to risk, by erecting machinery of this description, which was to involve it in that species of hazard : that they acted fairly, there can be no doubt ; and that they exercised a sound judgment, is evident from this circumstance, that a great variety of witnesses, whose evidence you have heard on the part of the plaintiffs, men of the highest eminence, and the highest character, told you, that in their judgment, and in their opinion, they considered this process less hazardous, even in the individual instance, than the process for which it had been substituted ; and, Gentlemen, on the other side you have, from Mr. Farraday himself, in distinct terms, that before these experiments were made, he thought the hazard less considerable than under the old system. All this shews the fairness with which they acted, and that when this machinery was raised by them, not on the premises which are insured, but on the adjoining premises, that it had been worked safely for three or four months, they did not think it necessary, because they did not suppose there was any hazard in it, at the time when this policy was effected, to state that this process was carrying on upon these premises. Gentlemen, I have thought it right in the out-set to state this, and direct your attention to it, to shew how purely, how honourably, these gentlemen stand in Court, to claim at your hands compensation for the loss and damage which they have sustained.

Now, Gentlemen, this brings me to consider, what are the objections which have been urged on the other side, to the plaintiffs right to recover on this action. Mr. Scarlett said, that one of the objections that he intended to insist on, I passed over very lightly. Gentlemen, I stand in a

situation of very great disadvantage as compared to the counsel for the defendants; here are fourteen or fifteen distinct defences stated on the record, it was impossible for me to anticipate which of those they intended to insist upon, at the hour of trial; no intimation was given to us by the other side, and for me to embarrass you, by going through fourteen or fifteen distinct defences in statement, would, I think, not have been very pardonable in that situation of the case. My learned friend then watches the course of our evidence, and he has his evidence ready for the purpose of meeting the particular circumstances we have endeavoured to anticipate.

Gentlemen, I stated what I conceived to be the rule, with respect to the description of the property. It is complained, in the first instance, that we have improperly described these premises; now, let me direct your attention to the description we have given, and see whether or not, it is properly described. It is, "on the building of their grinding-house and stoves, situate as aforesaid, on the engine-house, on the engine and utensils therein, the mill-work in the grinding-house, stock, and utensils in the sugar-warehouse, communicating by iron doors only, the building of the dwelling-house," and so on. Why, Gentlemen, this is all the subject that is insured; every thing that is insured, is described, and correctly and properly described, in this policy; but, my learned friend says, you ought to have described all the communications—all the buildings that were around it, and all the circumstances which could affect the risk by possibility. Gentlemen, that I deny; upon the face of the policy, all that is necessary to be described is, the property actually insured, and that must be correctly stated. If I assure part of an extensive manufactory, it must be known that it is insured as a part of an extensive manufactory; and who, looking at this policy, must not know that it was only a part which was intended to be insured, and if it is apparent that it is only a part that was intended to be insured, they must know that there were communications with other parts of the buildings. I am stating this, as it appeared on the face of the policy itself; but, when you see who are the defendants, how does it apply to the case, they knew the premises, they had written a policy on another part of the premises in the previous April, therefore they knew by what appeared on the face of the policy itself, that this was insured only as a part of more extensive property, that part is properly described, and that is all that is necessary.

Then, Gentlemen, how does it stand, that when I assure specifically that which is only a part of a building, if I de-

scribe that correctly, it is sufficient; and then, if the office are desirous of knowing, not with a view of inserting it on the policy, but for their own information, what are the situation and circumstances of the remainder of the premises, it is incumbent on them to apply for that purpose; and in that application, if any misrepresentation takes place, the policy will be avoided. Gentlemen, I am stating all this as it appears in evidence, but you all know, every office of this description has a surveyor, has an inspector; can you believe that—not in an ordinary risk, because it might be possible, that in an ordinary risk the surveyor would not be sent to look at the house, but in an extraordinary risk—a sugar-house, part of it before insured, do you suppose their surveyor did not know the situation of the premises? and that the surveyor had not been there, was not I justified in passing this lightly over? Was it to be supposed, any solid argument could be raised on this question? Was it possible for me to imagine that Mr. Scarlett intended to insist on it? and, give me leave to say, he passed it lightly over, and he treated it merely as a make-weight in the cause, passing it over, and coming shortly after to the real question between the parties.

Gentlemen, having disposed of this part of the case, allow me to direct your attention to that to which the greatest part of the evidence has been directed; but, Gentlemen, before I do that, let me not forget one observation arising out of the terms of these conditions; the terms are these: "In the insurance of goods, wares, and merchandise, the building or place in which the same are deposited, are to be described; it must also be stated whether such goods are of the kinds denominated hazardous," and so on, and "if any person or persons shall insure his or their buildings or goods, *and shall cause the same to be described in the policy otherwise than as they really are, so as the same are charged at a lower premium than is in the same proposals specified as applicable thereto*, such insurance shall be void." I do not care about the frame of the pleas, the pleas are founded upon this condition, or they are not; if they are not founded upon this condition, they are good for nothing; if they are founded upon this condition, all we have to do, to estimate the validity of them, is to consider what are the terms of the condition; it is not merely that there is to be a mis-description (I assume now, that the apparatus was on the premises assured by the policy), but it would not affect the policy, that a thing of the kind were omitted, unless the risk were encreased by it: and let us consider the conduct of the parties themselves on this point. You remember Mr. Harris was examined: Mr. Harris

had an insurance upon a sugar-refining house in Liverpool, it was conducted according to the ordinary process; he applied to this very Company to have a liberty indorsed on that policy, to carry on the process by means of tallow and oil, in an open pan, what did the office do? they endorsed the permission, and asked no additional premium for it, so that they did not consider this material, or that it tended to encrease the risk; so that, assuming this process had been on the premises insured, the omission to describe that process would not at all effect this policy, unless it had affected the premium; and I say, according to the act of the Company itself, in the case of Mr. Harris, that it would not have had that effect. Gentlemen, this was not a solitary act on the part of the office, for the policy was renewed at the end of the year, at the same premium, with a right to do this written in the body of the policy, therefore, I submit to you, most confidently, that in this part of the argument, my learned friends on the other side, are completely out of Court.

Now, let us look for a moment to the other objection. That objection is, that this process has encreased the risk, and that it caused the fire, for these two things are so blended together, as one joint proportion, in one plea; they do not say it encreased the risk, and therefore the policy is invalid, or that it caused the fire; but that it encreased the risk and caused the fire. Now, Gentlemen, allow me to point out, how, in point of argument, this case stands: we have acted fairly, we have paid a large premium, we are insured, the property is destroyed by fire—you have no right to recover, they say, for certain reasons; who is it, that is to make out to your satisfaction those reasons? The whole burthen of proof lies entirely upon the defendants, it is they who are to satisfy you, that this is an encrease of risk; it is they who are to satisfy you, that this caused the fire. If it is left in doubt, the case falls to the ground; if it stands as it does, according to Mr. Garden, “I think this mere conjecture, these are new experiments I should rather incline to think,” for that was his expression,—the cautious expression of a lawyer, in answering a difficult question of law: “I should rather incline to think, if I were called on, and compelled to give an answer, that this was the most hazardous;” is that the way to make out a case of that description? and this is one of the most intelligent witnesses; he said little, but every body acquainted with chemistry, knows Mr. Garden, and I appeal to my Lord, that there is not a more acute, and intelligent, and better informed, and sounder minded man in the community, than that particular individual; and he, who had been in Court during the whole



day, who had heard all the evidence, who had attended the experiments in White-cross-street, says, "I consider this as conjecture, but if I were compelled to give an opinion, I should incline to think, this, of the two, is the most hazardous." Such is the case made out on the other side, according to their own testimony.

Now, Gentlemen, let us look how does it stand; I am not going to embarrass you, after the attention you have bestowed to the details of the subject, and the notes you have taken of the evidence, by going through the evidence in detail, it would be a most idle waste of time on my part, and would call for your attention at a greater length than I ought to do, I shall, therefore, confine myself to the points in the cause, and you will apply the details in evidence in such a manner, as to come to that result, which the circumstances justify and warrant. We called before you persons of the highest eminence in the science of chemistry; we called before you, persons of the highest eminence in mechanical science; we called before you, persons practically conversant with this particular species of manufacture; these were persons who gave evidence before you, on the part of the plaintiffs. I will not mention the names of particular individuals, because it might be invidious; but Europe and the world does not produce men more enlightened in their professions, than these witnesses, and they told us, till we were tired of repeating the question, that they considered the present process the least hazardous of the two. I admit, this is met by counter evidence on the part of the defendants; but, I think, when you come to examine the manner in which it is given, and the grounds on which it is built, you will be of opinion, that it does not at all weigh in competition with that of the plaintiffs, because almost every one of the witnesses so examined, told you, almost in plain terms, that if it had not been for the lights thrown upon it by the new experiments, they should have thought it the least hazardous. Gentlemen, how does it stand? how are we then, in this situation of things, to make up our minds on the subject, so as to come to the conclusion, that this is the most hazardous operation of the two?

One of the witnesses on the other side said, that sugar would not boil over, that they could not make the sugar boil over; that is a most extraordinary statement, when you look at the construction of the thing itself, which provides a receptacle for the very purpose of holding that which boils over, if that is full, it must then run into the fire. I therefore look at the machine itself, as answering the testimony of Mr. Martineau. Mr. Daniel says, I never knew it boil over

in a particular state, but I have in another state; but was there any danger? No, because it was received in that receptacle; but if it had boiled with more intensity, it must have come over into the fire, or ash-pit; do you, therefore, think there is no danger of its boiling over, according to the old construction, and if it does there is a complete conflagration and destruction to the premises; but, Gentlemen, we have it in evidence, that several persons have been devising methods to counteract its boiling over; how happens it that Mr. Martineau directed his attention to boiling by steam? and, Gentlemen, it is most observable, that in order to produce that effect, it is necessary you should have high pressure steam, which, every body knows, is attended with very great danger, so that those gentlemen who suppose there is no danger in the process, are engaged in a very dangerous means of obviating it by high pressure steam. Gentlemen, one of the most intelligent men in the science of chemistry the world ever produced, Mr. Howard, directed his attention to this subject, and to obviate the inconvenience of high pressure, boiled in vacuo, and that is the patent the directors of the institution are carrying on at this moment, so that they who instruct their witnesses, or for whom the witnesses say there is no danger of its boiling over, are the proprietors of a patent to obviate that very inconvenience. Now, Gentlemen, when there is this conflict of evidence, and the affair is thus left in doubt——

*Mr. Serjeant Blossett.*—There is not the slightest evidence; nor do we know of the proprietors of this office being the proprietors of a patent for boiling sugar.

*Mr. Solicitor General.*—I am mistaken, it is the Phoenix Office, but *they are all alike*. The facts are so blended in the three causes, that if I introduce into one what belongs to another, I hope I shall be forgiven; but the argument is, that the same persons, carrying on business to a great extent, employing a great capital, have embarked a large sum to obviate this, which is said to be no objection at all.

*Mr. Serjeant Hullock.*—There is no evidence of that at all.

*Mr. Solicitor General.*—Mr. Scarlett stated, that Mr. Howard was the author of the invention. Let us go to the manner in which this danger is supposed to be produced; the oil is supposed to generate a gas or a vapour, which has passed over, and caught fire. Now we have taken oil, ordinary whale oil, and put it into the hands of a great variety of gentlemen; not novices in the business, but persons conversant with experiments of this kind; who, attentively considering the subject, have not been able to produce any thing of that description; they have not been able to produce any thing of

an inflammable nature arising from the oil, under a temperature of from  $500^{\circ}$  to  $600^{\circ}$ ; it is unnecessary to give the numbers: but, generally, they have not produced an inflammable product under the temperature of  $550^{\circ}$ .

Gentlemen, there is one exception, and that is Mr. Accum, Mr. Accum tells you, there was oil which was closed up in a vessel, which, for a period of nineteen months in succession, had been continually heated, and on that mass he made his experiment, that he produced an inflammable product at  $460^{\circ}$ ; but, Gentlemen, he describes that as a solid mass, at the ordinary temperature of the air, *so solid you might stand upon it*; utterly inapplicable, as I shall shew, to this machinery, utterly unlike the oil used for this process; but, however, the lowest temperature at which it has been created is, according to the testimony of all the witnesses of the plaintiffs,  $460^{\circ}$ . Now, Gentlemen, on the other side, I admit there are a great variety of persons who have made experiments, and they have produced the inflammable product at the temperature of  $350^{\circ}$ , that I admit; but, Gentlemen, with one or two trifling exceptions, of little experiments made on half-pints, one or two by Mr. Phillips, and some by another person, they were all made on that oil, which came from Messrs. Taylor and Martineau. I hope Mr. Taylor will not suppose I mean to cast the slightest imputation upon him; I do not suppose Mr. Taylor knew any thing of the composition of that oil being different from ordinary oil; but when Mr. Farraday tells me, that, occasionally, in the refining of whale oil, sulphuric acid is used, and Mr. Taylor will not say what might have been the result of the experiments, if this oil was so refined, and I state that renders it more volatile, and this effect would be sooner produced, what becomes of the case set up against us. I ask, whether, when the experiments made on that mass of oil are so essentially at variance, not in a small degree, but, radically and fundamentally at variance with the evidence of the plaintiffs, can you come to any other supposition, than that there was some foreign ingredient which produced the results which have been given in evidence to you, in the course of yesterday; what is the rule by which we proceed in Courts of Justice, in investigating the truth? sometimes facts are so stubborn, you must say, I will believe one, and reject the other; you are placed in that awkward situation; but the first thing that persons, who are to consider evidence, have to do, is to see whether it cannot be reconciled; in this case, it is reconciled in the easiest possible way, for all that you have to suppose, and it is no difficult supposition; after what Mr. Farraday has stated, there is no difficulty in supposing

that, in this oil, there was some foreign ingredient, which led to these extraordinary results, not only that have not been experienced by our witnesses, but, which had never been experienced in the scientific world; they were altogether new, a great discovery, and Mr. Garden says, it must all still be conjecture.

*A Juryman.*—Dr. Bostock says that.

*Mr. Solicitor General.*—Yes, it is Dr. Bostock. He says that it is so new, it must all be a subject of conjecture; so that it is not only at variance with the evidence of the plaintiffs, but it is at variance with all the chemical science in the world. Now, do I ask you too much, when I ask you to suppose there was a foreign ingredient in the oil, and you reconcile the whole case, and get rid of the difficulties of conflicting evidence, with which, otherwise, your minds must be so much embarrassed and entangled.

Gentlemen, applying this theory, let us look at the facts a little. May, the engine-keeper, says, that in the ordinary course, the fire of the engine was lighted by the watchman; he came when he supposed the fire had been lighted about ten minutes, he goes to the warehouse steps, and asks the man whether he is ready to have the engine put on—that sets the pump at work, it is done at a distant part—he says, “Not yet;” May waits a quarter of an hour, or twenty minutes, and goes again, and the answer is, “Just now;” on which he returns, puts the engine on, and goes to another part of the premises, and remains ten minutes, and there is an alarm of fire.

*A Juryman.*—The pump was not at work.

*Mr. Solicitor General.*—I beg leave to say, and it is a most material fact, that the engine being put on, puts the pump at work, it being worked by a strap on a pulley, which is never taken off.

*A Juryman.*—He had turned it on to the other machinery, but not to the pump, I think.

*Mr. Solicitor General.*—The pump is the first thing which begins in the morning, and he only waited for that; and when he got the answer, “Just now,” I understood he went back, and set the engine on, which itself sets on the pump, and then having performed his duty, he went down stairs. I am sure I am not mistaken.

*Mr. Serjeant Blossett.*—He constantly stated, that the pump was not set at work.

*Mr. Solicitor General.*—I am surrounded by some mechanics of the first reputation, who have seen the premises, and they tell me it could not be otherwise, it must set the pump at work.

*A Juryman.*—Not the pump; a separate strap may be put on to apply it to the pump.

*Mr. Solicitor General.*—The strap is never taken off. However, Gentlemen, I will put it thus: he had done all he, as engine-keeper, was to do; if the strap were to be put on, it would be put on by some other person.

*A Juryman.*—No, that is not so.

*Mr. Solicitor General.*—I am sorry this should be left equivocal.

*A Juryman.*—The pump was not at work.

*Mr. Solicitor General.*—When the man says, "Just now," he goes back to perform the operation; and I think the fair inference is, that it was put in motion. But, Gentlemen, at present, if you will allow the cause to go on, probably, afterwards, this may be rectified one way or the other.

*Lord Chief Justice Dallas.*—I shall read every word of the evidence.

*Mr. Solicitor General.*—You will see how the evidence stands: it takes about half an hour before the thing begins to work, the fire had been lighted about ten minutes, he goes out for ten minutes, and then returns; the first time, Muller said, "I am not ready;" at the expiration of the twenty minutes, he says, "Just now;" May then goes away for ten minutes, and is the engine-keeper to do nothing, if Muller was to be ready "just now?" Every body must assume that, during that ten minutes, the thing was set in motion; if, as I apprehend, there can be no doubt it was set in motion during that time: see how the case stands, the oil vessel is brought up to a temperature of 340°, that is the working point; the moment it is set in motion it goes down to the temperature of about 250°; by the operation of the pump causing the oil to flow through the cold sugar, it takes off a hundred degrees of temperature. Then, how does the case stand? whilst the oil is at 350°, or 340°, no effect whatever takes place; the gas-light is there—there is no explosion, every thing is quiet and tranquil. Afterwards, when it is reduced to the temperature of 240°, then, for the first time, this supposed explosion takes place: in addition to that, the whole of the preceding day it had been at work, and there was no emission of any vapour working till late at night—the gas-light always burning, the heat more intense than would be required in the morning, and yet no explosion. Is this, then, at all probable, according to the facts as they existed at the time? Is the story of this gas having taken fire, consistent with probability? If it had taken fire, is it probable it would have been at that time, and not in the course of the preceding day, when it was at the

working heat the whole day? Is it likely it would have happened at this moment, when it was at a lower temperature than at any other period of the operation?

It is supposed, that this oil had gone through the change, that they say is produced by constant heating, therefore, although a temperature of  $340^{\circ}$  or  $350^{\circ}$  only, was applied to it, it would emit this inflammable product. Now, mark the alteration in appearance, the oil goes through, before it produces this effect; all the witnesses on the other side tell you, that the oil to which they applied successive heat, had become quite thick, so that it was congealed and solid in the ordinary temperature of the air; one of them describes it as being reduced to a pitchy state; the oil produced by Mr. Accum, he said, was so solid you could tread on it; if that had been the case with respect to the oil in question, that must have been visible six or seven days before, when the oil was taken out. Mr. Wilson was examined to the state of the oil, and he says, the only difference in the oil was, that it had a blacker colour; if it had been in the state to which that oil was brought, that was subjected to the experiments made on the other side, and from which those results were produced, the consequence would have been, that these gentlemen never would have put it back again, seven or eight days before, into the oil vessel, but they would have put in another mass of oil. You will see what the consequences would be, supposing the oil at the ordinary temperature is congealed, and becomes thicker and thicker as you cool it. That oil is worked through a coil of pipe, and that being on a lower level than the oil vessel, it cannot flow back into it, so as to be in any way heated. The operation ceases during the night, and that which is in the extremity of the pipe remains congealed there, so that the action of the fire here under the oil vessel, would never extend itself to the remote part, and the pump could not work in consequence of the congealed state of the oil; in fact, they would have been reduced to this condition twenty times every day, or as often as they added cold liquor to the pan. I say this, to shew that the oil was not reduced to that state, in which the oil was on which the gentlemen experimented in White-cross-street, and from which they produced the inflammable vapour. In the first place, it is demonstrated by Mr. Wilson himself; in the next place, by the act of these parties restoring it to the receiver, about six or seven days before; in the next place, by the impossibility of carrying on this operation by the pump, if it were reduced to that state.

Then on this evidence, how does it stand? that this oil

from which these results are produced; has produced results which were never produced by any other oil, and therefore Mr. Parkes supposes there was a foreign ingredient in it. In the next place, it was dissimilar to the oil used here, and therefore you cannot argue, that those results would have been produced by that oil; I apprehend, if I make myself intelligible to you, it must produce conviction on your minds, that the oil was not reduced to that state to give out vapour in the time described, and therefore the experiments of the defendants' witnesses do not apply.

But, Gentlemen, it is stated, that this gives out vapour at  $350^{\circ}$ ; if so, this machinery was continually at that temperature, and it would have been giving out gas continually; their case, therefore, proves too much. The witnesses who proved the first experiments at Mr. Taylor's, stated, that on the second or the third day, at a very low temperature, somewhere between  $340^{\circ}$  and  $350^{\circ}$ , it gave out inflammable vapour.

*A Jurymen.*—At  $355^{\circ}$ .

*Mr. Solicitor General.*—Thank you, Sir. This would have been continually giving out that vapour, therefore, and it would have been descending, day after day, on the gas-light, and have exploded—their very case proves too much. In some cases, they say, inflammable vapour was produced down to  $310^{\circ}$ ; their case, therefore, goes to prove, that this process could not have gone on, that the machinery must have been destroyed in August or September, and, day after day, the vapour must have been exposed to the gas-light. Do not, then, all these circumstances prove to you, to demonstration—and demonstration is not necessary on my part, it is for them to make out the affirmative of the case, and it is sufficient for me to break in upon their case, and throw a probable doubt upon it: but I do not rest there, I ask whether these facts, combined together as they are, do not satisfy your minds, that the oil operated on by the gentlemen on the other side, (I mean on the great scale, because I place no reliance on the smaller operations) must have been mixed with a foreign ingredient, to which all these new results are to be referred.

Gentlemen, there is another observation, which is also very material: one of the witnesses, Mr. Farraday, I think, said, that the quantity of vapour emitted was very large; this operation had been going on for three months, if this emission of vapour was continually going on for three months, what must have been the result, *the quantity of oil in the boiler must have been exhausted*; now what is the evidence of Mr. Wilson, in that respect? “a few days before the machinery

was taken down for the purpose of securing the rivets, and we found some waste of oil, but very inconsiderable, not more than was sufficiently accounted for by the leakage, to repair which, it was stopped working ;” does not this shew I am right in the conclusion to which I come, that this oil could not have been inflammable in the manner in which that oil was, to which the defendants’ witnesses have spoken, for in that case, the whole of the oil must have entirely and utterly disappeared.

Then, Gentlemen, there is another theory my learned friend resorts to, he supposes it may have boiled up the pipe, and run down to the fire ; and something has been said of a close vessel and a pipe of two feet long, made to resemble this boiler, on which experiments were tried, when that effect was produced. This vessel, they said, was three feet long, fifteen inches wide, and fifteen inches deep, and they swore they put thirty-three gallons of oil into it. Mr. Bramah has made a calculation of the contents of that vessel, and he says, the quantity of oil was so near the size of the vessel, that the expansion would have caused it to burst up in that way ; there is a solution of that conjecture. On the other side, they do not rely entirely on the vapour, but they suppose that the oil may have got into the air, and run down into the fire, as to which there is not the slightest evidence. Here is a witness, Mr. Aikin, for whom I entertain the greatest possible respect, he has given most intelligent evidence ; but you will observe, that there was no actual minute enquiry, it was all theory, and plausible theory ; he says, the heat might decompose the mucilaginous particles that were in contact with the bottom of the vessel, that by that some volatile oil would rise up, which might, or might not, escape : he would not say, at what temperature it would escape. I do not mean to say he held back any thing, but he had not made experiments for that purpose, the probability is, that a temperature of  $350^{\circ}$  would have taken it off, so that, as it had been created, it would successively have left the mass, and every body knows the quantity of mucilage is not very great, and that long before three months the whole of it must have disappeared, and, therefore, I think, not much reliance can be placed on Mr. Aikin, in this respect ; nor do I believe, as a sober man, because I know him to be a man of sober judgment, that he would place great reliance on it himself.

Gentlemen, I have directed these observations to you, for the purpose of endeavouring to satisfy you, that the apparatus is not that hazardous machinery which is described ; and, when they use the result of their experiments, to shew that it



is so, I say that that result is by no means satisfactory; that, on the contrary, the result, comparing the whole thing together, will satisfy you, that the evidence on the other side, is wide of ours, operating on an ingredient of a different character, because; the ingredient made use of in this apparatus, could not have been of the character described on the other side.

But, Gentlemen, there is another thing to which I would call your attention; after this vapour is produced, it goes up the vent, and before it can occasion any danger it must come down again. Now there are a great many theories made use of about that, but if it had gone up that vent, and had come down by its specific gravity, it would have been diffused over the room; it is one of the most noxious things in nature, as Mr. Farraday told you; he is not quite sure whether it is quite so offensive as hydrogen gas, but supposing it to approach to that, if a small quantity came into the room, it must have been discovered. What is the evidence of May on this point? May went there twice, he made no discovery of the kind; twice he was at the door of the warehouse, and must have perceived it, if there had been any gas there; but he perceived nothing of the kind. This process must have gone on for a considerable time, it must have been perceived day after day, and they would have stopped the machinery to enquire the cause of it; therefore the thing speaks for itself, and shews that that effect could not have been produced—it could not have been produced at the time of the fire, and it could not have been produced at any anterior period, because it would have discovered itself in the manner in which I have stated to you.

My learned friend on the other side, makes a variety of suppositions with respect to drafts in this vent; (and we have heard a great deal about the Duke of Devonshire's mines). But every body knows (and it has been given in evidence this morning), that there must have been an extraordinary current up the steam-vent, for a reason which I have stated in the opening. The great object is to retain in the building, during the night, as much heat as possible, that being an object to the processes there going on; and the moment the doors are open below, in the morning, the heated air rushes up the steam-vent with extraordinary rapidity. But Mr. Martineau supposes, which shews he does not know this machinery, that, in consequence of the chimney being open, there may be a current down the steam-vent, to supply the chimney; that though there would be a tendency for the hot air to escape as it went up, another air might come down, to supply

the deficiency; but that is a misconception of the construction of the chimney-place; the chimney does not communicate with the air in the room, the fire is fed by a communication with the external air, which passes through the fire and up the chimney, so that there is no communication between the interior of the chimney and the sugar-house. I admit all that has been stated on the other side, that if you light a fire in one chimney, the smoke will come down another. Why? to supply the waste of air occasioned by the fire; but the moment you supply that fire-place which is burning, not with the air of the room, but with the external air exclusively, that effect ceases. My learned friend felt the force of this, therefore he supposes there might have been some extraordinary impulse of wind, which might have driven it down; but it was not a windy morning; but then the air might be so surcharged with vapour, that the tendency to rise might be diminished; these are speculations in support of which there is no evidence, but speculations which they enter into, to lead you from a rational conclusion. We may conjecture, we may imagine, and we may speculate, but that is not the way to decide the case. You are to be satisfied that the fire arose from this cause; you are to be satisfied that this is a more hazardous process; *that* is the averment on their plea, and *that* they are bound to make out; not by conjecture, not by surmise, but by evidence, upon which you are to decide on your oaths, the important and valuable rights of parties.

But, Gentlemen, we are pressed, on the other side, by one observation to which I would wish to direct your attention, I mean as to Muller. My learned friend says, Why have you not called Muller? Gentlemen, there are observations of this kind that are the common properties of us all; these observations are made over and over again, and we know beforehand what will be said—"You have a witness in your power whom you might call, and have not." I remember hearing that observation made in this Court some years ago, by one of my learned friends, and I remember the Lord Chief Justice, who then presided, making the following remark: "I have heard that observation often repeated, but the distinction, in my mind, is this, where a party is in possession of a written document of which the other party had no evidence, and withholds it, the Jury will presume every thing against him; but when you make that observation as to a living witness within your own power, whom you yourselves may call, if you think he will serve your purpose, the observation falls to the ground, because you may repel any inference by calling the witness." Now if the witness should

be in Court at the time, subpoenaed on the other side—and, Gentlemen, *he is in Court, and is subpoenaed by them—if, therefore, they had thought him material to their case, why have they not called him?* One can easily understand that a servant may get into the possession of the adverse party, and we might call him to be cross-examined; these are supposable cases that may exist in a cause, but I do not rely on that, but I say, if he is a material witness, he is in Court, and if we did not call him, it was competent to them to offer his testimony to the Jury; and therefore, I repeat the observation of Lord Chief Justice Gibbs, that I do not think the observation applies to testimony of this description. I hope you will bear in mind the distinction I have made. I do not express myself in the strong language of the learned Judge, but the principle is this, if you withhold what the other party cannot obtain, every thing shall be inferred against you; but if a witness is in *the possession of the other party*, and you do not call him, there is no inference against you. My learned friend says, what a material witness Muller is; is he so? if so, *why did not they call him?* All these fine-spun theories which are related on the other side, they might have confirmed by the testimony of Muller; Why did not they call him? *because they knew he would have contradicted them:*—the argument does not weigh as dust even in the balance.

Gentlemen, let us look, for a moment, at the appearances of the fire. Willoughby and Clayton are the witnesses who have spoken to it on the other side; Willoughby first sees the fire—what is the appearance? there is no smell, although this gas, or this vapour, is extremely offensive. Now, if it all explodes, possibly you will not smell much; but then it must be mixed, in a certain proportion, with the atmospheric air, for all to explode; if part is mixed, that explodes, and dissipates the rest, which is carried to the right and the left, and is extremely offensive to every body near it; therefore you are to suppose the vapour entirely mixed, so that every part of it was to come into combustion: but for this purpose you must give my learned friend every supposition in his favour. What is the colour of the fire? we had it exhibited yesterday, a pale, clear colour; flame is pale in the proportion in which it is mixed with the atmosphere; but what do the witnesses say? What does Mr. Willoughby say? he says it was the colour of ordinary flame. What does Mr. Clayton say? it was red, like ordinary fire: does not this negative the idea, that this fire was caused by the ignition of gas.

But, Gentlemen, they rely on an explosion. I say, that is decisive against them; and I will tell you why, in this instance,

an explosion takes place, and bursts out the window, and the fire goes on burning. Now I will tell you the effect which would have been manifested if this had arisen from an ignition of gas: the explosion would take place, and burst the window, and go through the window, and in passing through it, it would light the materials about it; it would then cease till these had taken fire, and afterwards, in a short time, it would be followed by the consumption of the place. Is this like what was seen? nothing at all—it burst through, and continued burning in the way ordinary fire does. Now, what is the effect of fire in a room? It lights the apartment, bursts the windows, and rushes out with an explosion similar to this, and *continues* burning, which was precisely the case on this occasion, and is quite unlike the explosion of gas. I think no man can entertain a doubt on the subject.

Then as to the window, I do not say Willoughby tells a falsehood, but May must have seen it, if it had been where they describe, because he opened the door of the warehouse nearly opposite. Willoughby might have been mistaken as to the window, and I will tell you why; he was on the same side of the way as this building, and looking down the narrow street, along a whole range of windows, he saw one on fire, he had no reason to look at the particular window, he gave the alarm, and went away. But if he is mistaken as to the window, it is all reconcileable with our evidence, for what is the case? Mr. Wické, a sugar-refiner, whose premises are in the neighbourhood, looks down the end window, he sees no fire in the fill-house, where the gas-light was, but he sees it towards the end of the long warehouse, in the same direction in which May states that he saw it. May tells you where the door was, in relation to the pump, and in this point he differs from Mr. Lockie; but Mr. Lockie never saw the premises in that state, Mr. Lockie never saw the pump up, and cannot be certain as to its situation; but May, who worked, from day to day, on the spot, points out the place where the door was, and the fire was to the left of it; and this conforms entirely with the testimony of Mr. Wické, who saw it in that place. Mr. Auber, is a wood merchant in the neighbourhood, unconnected with these parties, and he looks through the second window from Union-street, and therefore he cannot be mistaken, and he sees the fire upon the warehouse floor, a little to his left; all these witnesses confirm each other. The testimony, on the other side, of the man who merely saw the fire bursting out of the window, and then gave the alarm, may be mistaken; but this is a precise, distinct evidence, and cannot be mistaken; they must come here to

perjure themselves, if what they say is not true. Now, is this at all consistent with the case they have made? Is the flame which these persons saw, at all consistent with the explosion in the lighting of the gas, and so on? In colour it is not like it, in smell it is not like it, in continuity of flame it is not like it, in position it is not like it; I say, therefore, independently of all speculation, supposing that to be in equilibrio, considering what are the broad and distinct facts to which witnesses, without science, seeing the facts, speak, and taking into consideration the situation and the means of observation (the circumstances to which the thing is to be referred), I think you must be of opinion, that the evidence is distinct and positive on our side, and vague and equivocal on the other.

Now, Gentlemen, we are pressed with another observation; my learned friend on the other side says, but can you account for this fire: I should have thought it unnecessary to make an observation on that subject, but that my Lord referred to the evidence of Mr. Anthony Robinson, who says, "I have been engaged in the trade for thirty years, and during that time, I have not been able to ascertain the cause of any fire in a sugar-house," so that we are to be called on to assign a cause under these circumstances, and it is to be supposed and argued strongly against us, that we do not. But a fact has come out, to which my attention was directed by my learned friend behind me, which is, that there were lights up stairs; the ordinary practise was to put out the lights in the warehouse, where they were left, and when the men went in the morning, they took the lights and made use of them; if there were lights up-stairs, it is clear that these candles had been taken out of the warehouse, lighted at the lamp in the grinding-house, and the men must have gone through the warehouse to go up-stairs—you have a cause then at once. You have a description of this species of property; it is not so much from the pan, as from the combustibility of the materials, that the danger arises here; then, I say, the cause of the fire was, the persons passing with lighted candles through the warehouse, up to the rooms above, if it were necessary for me to assign a cause, there is one; but I revert to the original observation, that I am not called on to do it,—Providence inflicts these calamities, and the causes are usually unsearchable and undiscoverable.

Another observation is made, and with that I shall conclude my long address to you. My learned friend says, this work had been in existence only three months, when the fire took place, and therefore, he ascribes the fire to this cause.

Upon this point I need only refer to the old and well-known story, that the building of Tentendon church, was the cause of the Godwin sands; the things happened contemporaneously, and therefore they are referred the one to the other, as cause and effect; and that is the sum and substance of the argument used in the present instance.

How does the case stand then? Is there any thing to shew you that the premises are improperly described? I am sure not. Is there any thing to shew an encreased risk? I am sure not. Is there any thing to shew that this is the cause of the fire? I am sure not. Unless you are satisfied of these facts, you must find your verdict for the plaintiffs; but (heavily and grievously as this loss will fall upon them,) yet after the patient enquiry, this cause has gone through, after the attention you have bestowed to every part of it, should you come calmly, soberly, and coolly, to the conclusion, that the risk was encreased, and that the fire was caused by this process, my client must acquiesce in your determination, and they will be content.

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### SUMMING UP.

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LORD CHIEF JUSTICE DALLAS.

Gentlemen of the Jury.

This is an action brought by the plaintiffs, Benjamin Severn, Frederick Benjamin King, John Severn, and Thomas Bishop; against Robert Slade, William Lewis, and Daniel Mildred; and the declaration in substance states, "that in the month of October, 1819, on the 21st of that month, by a policy of insurance made by the defendants, reciting, that the plaintiff's, Severn, King, and Co. of Church-lane, White-chapel, sugar refiners, paid the sum of 62*l.* 12*s.* to the Imperial Insurance Company, and agreed to pay, or cause to be paid to the said Company, at their principal office in London, the sum of 62*l.* on the 29th of September, 1820; and the like sum yearly, on the day last aforesaid, during the continuance of that policy, for insurance from loss or damage by fire, not exceeding, in each case, the sum or sums therein-after mentioned, on the property thereby described, in the place or places therein after particularised, and not elsewhere, unless previously allowed by indorsement on that policy; viz. on the building of their grinding-house and stoves, situate as aforesaid, 3000*l.*; on the engine-house, 400*l.*; engine and utensils therein, 400*l.*; mill work in grinding-house,

1200*l.*; stock and utensils in sugar warehouse, communicating by iron doors only, 3000*l.*; the building of dwelling-house and counting-house, detached from the above premises, brick-built, 700*l.*; counting-house, fixtures and furniture in counting-house, 200*l.* It was declared and made known, that from the day of the date of the said deed, and so long as the said assured should duly pay or cause to be paid, the said premium to the said Company, at the time aforesaid, and the acting Directors of the said Company, for the time being, should agree to accept the same, the capital, stock, or funds of the said Company, should be subject and liable to pay to the said assured, their heirs, executors, and administrators, for the damage and loss which they should suffer by fire on the property therein mentioned, not exceeding the sum of 8,900*l.* according to the tenor of their printed proposals, accompanying the said policy;" and the declaration then states, that "there was received at the same time," which is immaterial, "13*l.* 7*s.* for stamp duty," the printed proposals themselves are then set out verbatim in the declaration, and they stipulate, amongst other things, that all manufactories which contain furnaces, kilns, stoves, coakles, ovens, or otherwise use fire heat, are chargeable at additionable rates." It then alleges that the plaintiffs are interested to the amount insured, and "that on the 10th of November, 1819, the whole of the said goods and buildings were destroyed by fire, that, the particulars relating to the said buildings were delivered and accepted as sufficient by the said Company, at the time of effecting the insurance, that the buildings and goods were not described otherwise than as they really were, so as the same should be charged at a lower premium than, in the printed proposals mentioned, is applicable thereto;" they then state, that notwithstanding the loss alleged to have been by fire, the defendants refused to pay. The second count states, that the plaintiffs "were interested in the said goods and fixtures so by them insured as last aforesaid, to a large amount, to wit, the amount of all the money by them at any time insured thereon, and that the said Benjamin Severn and Frederick Benjamin King, were, at and during all that time, interested in the said buildings and houses."

To this declaration there are several pleas, the substance of which, as abstracted now before me, it will be necessary that I should (before I state to you the evidence,) state to you—and the first plea goes to all the counts in the declaration, and it is, "that the goods, and fixtures, and buildings, and houses, were not destroyed by fire;" and upon this there is an issue. The second plea is, "that the loss and damage was

not occasioned by any of the causes or reasons in the policy mentioned, or intended to be included in the same, but was occasioned by a mode or process introduced and employed by the said plaintiffs in the boiling of sugar, that is to say, a mode or process of boiling by the means of heated oil—that the risk or hazard of the defendants, under the said policy, was much encreased, by reason of the introduction and employment of the said process, and that the same was so introduced and employed by the plaintiffs, without any notice to the defendants, or their consent being obtained to the same. The third plea states, “that before, and at the time of the loss, the mode or process of boiling sugar by the means of heated oil, was used and employed by the plaintiffs, in the said buildings, and that the risk and hazard of the defendants became and was much encreased, by reason of the use and employment of the said mode or process, and that the same was introduced and employed by the plaintiffs, without any notice thereof to, or consent by the defendants.” The fourth plea is, “that before and at the time of the execution of the said policy, there was another building, called the long-house, otherwise the long sugar-house, otherwise the three-pan sugar-house, adjoining to the said building in the said policies of insurance mentioned, and therein called the grinding-house, and communicating therewith; in which said building, so adjoining as last aforesaid, a certain process or manufactory, that is to say, the process or manufactory of boiling sugar by the means of heated oil, was carried on by the plaintiffs, and the hazard of the defendants, under the said policies of insurance, was greatly encreased by reason of the said process or manufactory being carried on as aforesaid.” The fifth plea goes to the first and second counts, and it states, “that the particulars relating to the said buildings were not taken as sufficient by the said company,” upon which there is an issue joined. The sixth, going to all the counts, states, “that the buildings were not truly described, but were described otherwise than they really were.” The seventh plea is to the first and second counts, “that the building did contain a furnace and stove, and an oven, used in the process of a manufactory that is in the process of boiling sugar by means of heated oil, whereof mention was not made in the said policy.” The eighth plea is to the first and second counts, and in substance it is, “that the buildings did contain three furnaces, three ovens, and a stove, used in a process and manufactory that is made use of in the process of refining sugar, whereof mention was not made in the said policy.” The ninth plea going to the third and



and last counts, sets out, "that each of the said policies in those counts mentioned, contained certain conditions thereto subjoined, two whereof were to the effect following, that is to say, "No 1. Persons desirous to make insurance on buildings, were to deliver into the office the following particulars, viz. a description of the buildings, where situate, by whom occupied, of what materials the walls and roof of each building intended to be insured, were composed, whether the same were occupied as dwelling-houses, or as warehouses, manufactories, workshops, or how otherwise. Houses not duly separated by party-walls, were deemed brick and timber; all manufactories which contained furnaces, kilns, stoves, coakles, ovens, or otherwise use fire heat, were chargeable at additional rates. No. 2. In the insurance of goods, wares, or merchandise, the buildings or places in which the same were deposited, was to be described: it must also be stated whether such goods were of the kinds denominated hazardous, and whether any manufactory was carried on in the premises. And if any person or persons should insure his or their buildings or goods, and should cause the same to be described in the policy otherwise than as they really are, so as the same be charged at a lower premium, than is in the said proposals specified as applicable thereto, such insurance should be void; or if any building should contain any kiln, furnace, steam-engine, stove, or oven, used in the process of any manufactory, unless mention was made thereof in the policy, it should be void in respect to such building and the goods therein; that the said buildings were not duly described, but the same were described, in the said policies of insurance, otherwise than as they really were, and so as the same were charged at a lower premium than in the said proposals specified as applicable thereto." To the 3d and 4th counts, the tenth and eleventh pleas are similar to the seventh and eighth. These are the pleas put on the record, in answer to the declaration.

The replication to the second plea is, "that the loss and damage was occasioned by a cause and risk in the said policies, mentioned or intended to be included in the same, and not by a mode or process introduced or employed by the plaintiffs; that is, a mode or process of boiling sugar by the means of heated oil; nor did the risk or hazard of them, the defendants, under the said policies become, or was encreased, by reason of the introduction of the said mode or process;" and upon this issue is joined. The replication to the third plea is, "that a mode or process in the plea mentioned, was not used or employed by the plaintiffs in the said buildings;

nor did the risk or hazard of the defendants become increased thereby;" upon which also issue is joined. The replication to the fourth plea is, "that the risk of the defendants was not increased by reason of the said process, or manufactory of boiling sugar, by the means of heated oil, being carried on before, and at the time of executing the said policies in the said buildings;" upon which also there is an issue joined. To the sixth plea, "that the said buildings were not described otherwise than as they really were;" and upon this also, there is another issue joined. To the seventh plea, the replication is, "that the premises did not contain a furnace, a stove, and an oven, used in the process of boiling sugar, by means of heated oil, whereof mention was not made in the policy;" upon which also issue is joined. To the eighth plea, the replication is similar. To the ninth plea it is, "that the buildings were not described in the said policies otherwise than as they really were, or so as the same were charged at a lower premium than in the said proposals specified;" and the replications to the other pleas apply to the third and last counts.

*[The learned Judge then proceeded to read the whole of the evidence, verbatim, from his notes, which occupied rather more than three hours; and, having concluded, he proceeded to address the Jury in the following terms:]*

Now this is the whole of the evidence on the one side, and on the other; which, in this very important cause, I thought it my duty to read over to you, though it has consumed a great deal of time; it was a duty, which I, for my own sake, would willingly have dispensed with; but I thought it my duty to state the evidence to you, referring to your own recollection and notes to supply any deficiencies, if I have made any, or to correct any mistakes, if I have made any, in taking down the evidence. Gentlemen, the questions for you to try, disentangled from the technicality of the pleadings, which I have also thought it my duty to state to you, are, as stated by Mr. Scarlett, in substance three; that the premises in question were consumed by fire is perfectly clear, and that the plaintiffs are entitled to recover is equally clear, unless they have violated any of the conditions, either implied from the very nature of the contract into which they entered with the Insurance Company, or to be found in the express and printed conditions themselves.

Now, with respect to the objections as made by Mr. Scarlett, they are in substance these; he has told you, that they resolve themselves into three points for your consideration, and the first is, and it is one of the issues that you have to

try, whether in this case, the premises in question have been truly and correctly described, for not only by the express conditions set out in the printed policy, but (as all depends upon the nature of the buildings to be insured) in the sense and reason of the thing, it is very necessary that they should be correctly and sufficiently described; and if, in this case, the premises insured have not been correctly and sufficiently described, that would supersede the necessity of considering any other question, because, most undoubtedly, the policy itself would be void. Have, or have not, then, the premises in question been sufficiently described, which is one of the issues you have to try. On the part of the plaintiffs it is affirmed, that they had been so, on the part of the defendants this is denied; have they, or have they not, then, been sufficiently described?

Now, what is the objection raised against the description given—it is said that these premises consist of different apartments, all of which, taken together, form one building, in which this process is carried on; and that they consist of (as far as relates to the present purpose) the long-house, the grinding-house, and the new-house; that in this case the long-house and the grinding-house having been insured, the policy insuring them was renewed, and that between the time of effecting the original policy, and the renewing of that policy, a new building had been erected, called the new-house, and according to the objection made to the description given of these premises, this circumstance had not been mentioned.

*Foreman of the Jury.*—Was the long-house insured?

*Lord Chief Justice Dallas.*—Yes, and which, according to the description given, had an iron door communicating with the grinding-house; now, therefore, it is for you, and for you entirely, to consider, whether the circumstance of this not being added to the policy, when the policy was renewed, constitutes such a variation of description as to lead to the important consequence of making this insurance void, for sure I am, that though, in point of fact, this building was made after the original insurance was effected, and not mentioned in the renewed insurance; yet, if it were a distinct, building that has been destroyed, communicating only in this way in which it has been described, and by an iron door; you will judge for yourselves, whether, if that had been communicated, there is any probability whatever, that it would, in the estimation of the Insurance Company, have raised the risk, so as to make an additional premium necessary, for the averment is, that the risk was thereby encreased; and the ar-

gement is, that because an additional fire was added, therefore the risk encreases in proportion to the number of fires, and that in this respect, therefore, the defendants are entitled to your verdict, upon this issue ; namely, that the premises in question have not been properly described. Now, upon that, you, having the model before you, having heard the evidence that has been given, and attending to the observations made on the one side and on the other, I leave it to you entirely, to say, whether there be, or be not, an adequate description, or a correct description, in the language of the plea of the premises insured in this case. That is a point on which, on the evidence, you are to judge entirely for yourselves, and you will tell me what your opinion in the result is, one way or the other.

The next question that arises for consideration, is, the question of fact, where this fire actually took place; did it take place in that part of the building in which this process was made use of, or did it take place in the warehouse, or any part of the building above? Did it take place from the application and use of the process in question, or did it take place from any cause different from, and entirely unconnected with it? Now, with respect to this, I must say, speaking for myself, that the subject is involved in a very considerable degree of mystery: we are now in the heart of the city of London, trying, on the third day, an important question of this description, involving the consideration, where, upon sugar premises, a fire actually took place and broke out; and it is attended with this singularity, to my mind a great one, that the very person on the spot (Muller), who had the charge of lighting the fire, and taking care of the fire; that the watchman employed on the premises, both of these faithful servants, having been employed for years before, and continuing still to be employed, though now in Court (according to the best information we have received) neither of these persons, who best could speak to the origin of the fire, are produced as witnesses before you. I own, Gentlemen, be the fault where it may, in holding back this evidence, it effects my mind very considerably, in the consideration of this question. In endeavouring, out of a Court of Justice, to investigate the origin of this conflagration, to whom would you naturally turn, in the first instance, to know how it could take place; and if any one of you, Gentlemen, not now sitting as Jurymen, but in your private and individual capacity, had been told, that at the time in question, there was such a person employed as Muller was, and another person employed as this watchman was, long the servants, continuing the servants,

and still the servants of the plaintiffs, in this action, are they not the persons whom you would have called for yourself, in the first instance, for information as to the origin of this fire—and we are not, Gentlemen, to get rid of our common sense, by coming into a Court of Justice; here it continues the same, at least, (I trust) as it is elsewhere; and, sure I am, that the bulk of mankind, out of a Court of Justice, whether rightly or wrongly, I will not examine, would have been greatly dissatisfied, if persons of this description, with these means of knowledge, had not been produced: to the last moment of my life I shall think so, and can never think otherwise. Gentlemen, I will not enter into the consideration, whether they ought to have been produced on the one side, or on the other; still less will I examine, having too high a reverence for the memory of the departed Judge, who formerly sat in the place which I now unworthily fill, as to the inference to be drawn, one way or the other, from withholding papers, or the not producing witnesses. These things are very often true in the theory, and in the abstract, but of very little practical application; for, sure I am, that mankind in general never will be satisfied, when the party on whom it is naturally most incumbent to bring forward a witness, declines doing so: and (considering the two sides in this case), it is most incumbent on those who seek to recover, to give any possible information to the office how this fire took place, and it was most natural to call on them to bring these witnesses forward; they, however, have not done it, and I only draw your attention to these circumstances, giving no opinion upon the effect of them myself, but leaving it entirely to you to consider them, not taken singly, so as to draw an improper inference from an unfavourable appearance, but taken in combination and connexion with all the other facts of the case; for still this is but to weigh in combination with all the other facts of the case. It is only to be taken into consideration with these facts, and if, ultimately, you should be of opinion that the fire did not happen by this process, it could signify nothing that these witnesses have not been called; but, in this case, in which it is so doubtful how the fire did originate, I own I am, for one, not satisfied that those witnesses have not been called; I will not say what inference I draw from it; I draw none, because, sitting where I do, I trust I shall always be most cautious in venturing to impute unworthy motives to respectable persons; there may be many reasons for it, with which I am not acquainted, and all I can state at present is, that I lament that my mind is left in that state, in which it might not remain one way or the other, probably, if these witnesses had been called.

Now, having stated thus much to you, and in the absence of this evidence, the question is, where you do think that this fire actually originated; if it originated where this process was made use of, that would be strong to shew that it was a dangerous process; but, still, if it were not a dangerous process, though by accident the fire took place where it is made use of, it would not maintain the affirmative of the plea of the defendants; namely, that the process itself is more dangerous than the ancient method; but, still, it would be a strong fact in the way of evidence, to shew that the new process was more dangerous than the other process.

Now, deprived, as we are, of the testimony of the persons I have mentioned, one on the spot in the building, and the other immediately contiguous to it; let us see, one way or the other, what are the probabilities of the case. In the first place, we are to attend to the consideration of general probabilities: this sugar-house had existed for a great number of years, carrying on this business extensively, without a fire ever having happened there before. On the other hand, it is true, as you have been told, that fires have taken place in many sugar-houses at different times, and we all know they have; and you are told also, by a person of much experience, that he has never been able, in any one instance, to ascertain to what cause any one of these conflagrations was owing; and, therefore, it is fair to say, that experience tells us, in other circumstances, that these fires may be attended with a degree of mystery, and may arise from unknown causes, which may be long hidden in darkness. They often take place during the night; a spark will kindle a conflagration in a moment, and the cause remain for ever undiscovered; and as it has happened in other cases, so it is fair, and in strict reason it is right, to conclude that it might have happened in this way, in the building in question. On the other hand, there are considerations of a peculiar nature, and that is, that never having happened before, it should, for the first time, have happened three months after the introduction of this peculiar process, never made use of before, except in two or three instances mentioned; abandoned in one, (not from any estimate of its being attended with danger, but in fact abandoned), a process very little known, a great novelty, appearing to have been watched, day after day, by Mr. Wilson; and in this sugar-house, three months after its introduction, at the very time of the morning when the men would begin to work, then it is that this fire takes place, and breaks out, and the person present is not actually called. Of that you will judge, as a coincidence of an extraordinary sort, taking it with the

other circumstances, and contrasted with the other probability I have stated, as to fires taking place in sugar-houses, and the cause remaining unknown. Then, Gentlemen, as to the place in which the fire originated, you will judge entirely for yourselves; and I need not repeat what I have said before, that if you are satisfied that it took place in the building where this apparatus was, at the moment when they were beginning to apply the fire to the oil, and conduct the process, (I say nothing in the way of opinion myself), but you will judge, whether that is, or is not, strong evidence to shew, that the process in question was of a dangerous nature; with respect to that I give no opinion, it is entirely for you to judge.

But, Gentlemen, I should tell you, before I bring you to the question of the encrease of risk, that it is but fair to conclude, it being contended, that though it cannot be shewn expressly where the fire began, the probability is, that it did not begin in the room where the apparatus was, but in the warehouse over it. That in the warehouse there were hogs-heads, some with sugar, others scraped, and others steamed; there was straw and paper, and there had been, shortly before, candles in the upper part: that you will take into your consideration as part of the subject on which you are to deliberate.

I come now to the important question, namely, whether the introduction of this process has been attended with an encreased degree of danger. Now, with respect to that, though it be the most material question in this cause, and that into which, with the exception of the first (the description of the building), the others will, more or less, resolve themselves, I shall content myself, in this stage of the case, and should in any stage of it, with referring you to the evidence that has been given; for we have been now employed in the examination during two days, of a great number of the most intelligent persons that this country or Europe can produce. When I say the most intelligent, speaking with proper courtesy with respect to foreigners who are absent, and who are also highly intelligent; at least I may say of those of my own country, men as intelligent as any Europe can produce. I am myself more or less acquainted with all the writings of every one of the gentlemen produced, from this I know their information, I know their talents, and whether my time has been well or ill employed, I will not say, but I am proud to acknowledge, that from their labours, I have received at times a considerable degree of pleasure; but I must add, that these two days, thus employed, are not days of triumph, but days of humiliation for science; for

when I find that their science ends in this degree of uncertainty and doubt, when men of the first intelligence, a constellation of talents of such brightness as this, is brought forward to shine upon us, and when I observe that they are drawn up in martial and hostile array against each other, how is it possible for a common man like me, to form, at a moment, an opinion upon such contradictory evidence? I am at best in a state of half knowledge, which would be worse than ignorance, if I were to apply it, or presume to apply it, in a Court of Justice, to the real and momentous transactions of mankind. I never have and never will follow, that course; those who walk in the twilight should proceed with caution, you will not, therefore, expect any opinion upon this part of the case from me, I can form none—volumes have been spoken upon it, and I foresee, without being blessed with the spirit of prophecy, that volumes will be written upon it, and so they ought, for the elucidation of science, and the enlightening of mankind, because experiments of this nature are new. In this case, therefore, it is quite impossible for me to be of any assistance to you; speaking for myself, I should say, that, at the most, my mind is conducted to that point at which I am thankful, for myself, my mind may rest; it is conducted up to a degree of doubt—to me it is permitted to doubt, to me it belongs to doubt; if I entertain doubts that require more examination before I can come to a sound conclusion: but to you, it is not permitted to doubt; you may doubt, but doubt cannot end in doubt, for however much you may doubt, with a degree of assurance more or less strong, still you must decide; and to you, therefore, whose duty it is to decide, I leave it, upon this contradictory evidence, to say, whether, you do think, or do not think, that the process in question is attended with more risk, than the former process made use of: that, upon this part of the case, is the issue that you have to try. Independently of the scientific evidence that has been delivered, you will also attend to the facts of the case; the great body of flame that rushed out, the want of smell at the time, the colour of the flame, all those facts into which you have so minutely, so correctly, and so properly enquired for yourselves; and combining all the facts of the case with the opinions that have been given, you will say, what you think upon that: but I must add this, because, cautious as I am, in making observations that may have any weight, and always desiring that no observation I make may have any weight, more than in your judgment belongs to it, that it may not derive any authority from me, merely because I make it (which I know, on common occasions, you



would, incline to give it), but desiring you will not here, knowing that one is made uneasy, by reflecting that any strong observation should be made by him, who is to hold the scales perfectly equal. I do venture to make this observation, that it was incumbent upon those who have averred the encreased danger of this process, not to leave that in doubt, but to make out their proposition, the affirmative lies upon them; and the question is, whether they have proved it; if you doubt that it is not more dangerous, or if you think it is not, then they have not proved it; and in a doubtful case between individuals insured to this large amount and a public company, the leaning, it seems to me, but of that you will judge, (there should be no leaning, if one could avoid it) but if there is a leaning, it should be in favour of the individual insuring with a company, because it is better that the loss should fall on a large body, than on an individual. I have stated the different views of the question, revolve it in your own minds, it may not require much time after your attention to it, and tell me what your opinion is.

The Jury withdrew at four o'clock, and returned in three quarters of an hour, finding a verdict for the plaintiffs, the damages having been agreed at 7181*l.* 2*s.* 6*d.*

*Foreman of the Jury.*—There were three points on which your Lordship desired us to form our opinion, we have done so, and I will state it. We find, first, that the premises are truly and correctly described in the policy; secondly, that the fire did not commence in the place where the new oil process was carried on; thirdly, that the risk was not encreased by the new process of boiling sugar by heated oil

*Lord Chief Justice Dallas.*—The public are greatly indebted to you, for the great attention you have paid to the cause.

*Mr. Serjeant Vaughan.*—It will be desirable to know whether they intend to try the other two cases.

*Mr. Serjeant Blossett.*—They are totally different in all respects.

*Lord Chief Justice Dallas.*—They cannot be tried these sittings.

*Mr. Serjeant Lens.*—They be must remanets of course.

*Mr. Serjeant Hullock.*—Let them be made so.

*Foreman of the Jury.*—We are much obliged to your Lordship, for your attention and kindness.

THE END.

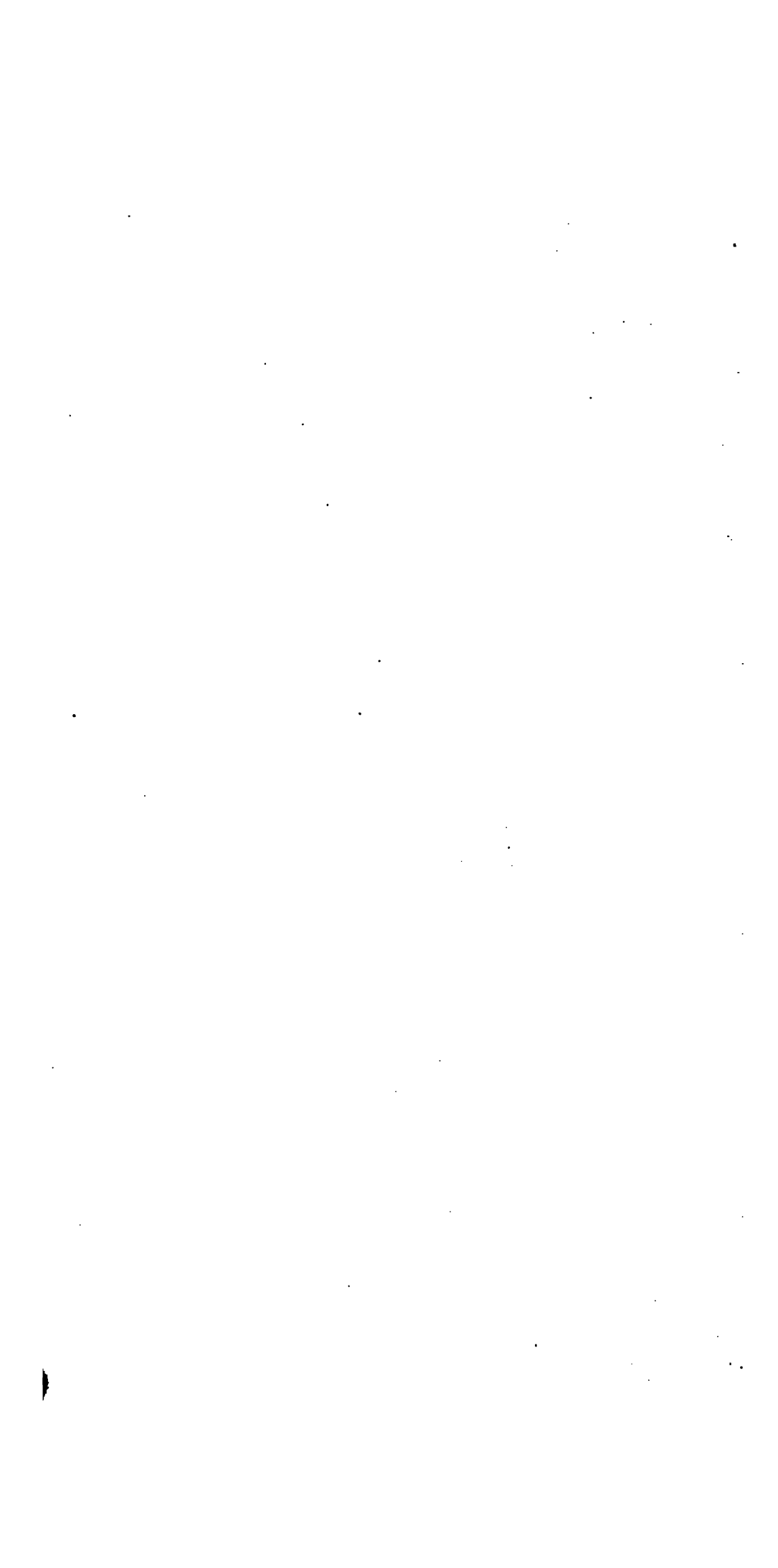
## INDEX.

—101—

ACCUM, F. ESQ.....	72
AIKIN, A. ESQ.....	194
ALLEN, W. ESQ.....	79
AUBER, MR. SAMUEL.....	39
BARRY, J. T. ESQ.....	82
BOSTOCK, DR. JOHN.....	176
BRAMAH, T. ESQ.....	96
BRANDE, W. T. ESQ.....	69, 209
CHILDREN, J. G. ESQ.....	179
CHRISTOPHER, WM.....	140
CLAYTON, JOHN.....	128, 202
COOPER, J. T. ESQ.....	87
COXWELL, H. ESQ.....	91
DANIEL, F. ESQ.....	191
DEVILLE, JAS. ESQ.....	92
DONKIN, BRYAN, ESQ.....	59
DUKE' GEORGE.....	15
FARRADAY, MR. MICHAEL.....	157, 204
GARDEN, A. ESQ.....	193
GILL, T. ESQ.....	91
HARRIS, JAS. ESQ.....	54

HENDRIE, R. ESQ.....	90
LAMP, CHRISTIAN.....	32
LOCKIE, MR. JOHN.....	133, 217
MANBY, AARON, ESQ. ....	53
MARTINEAU, MR. JOHN.....	188
MAY, HENRY.....	23, 97, 212
PARKES, SAMUEL, ESQ....	62, 207
PHILLIPS, RICHARD, ESQ.....	169, 210
ROBINSON, ANTHONY, ESQ.....	58
SILVESTER, C. ESQ.....	85
SMITH, ALEXANDER.....	156
SOLICITOR GENERAL'S OPENING.....	1
————— REPLY.....	218
MR. SCARLETT'S DEFENCE.....	99
TAYLOR, J. ESQ.....	181
WALKER, R. ESQ.....	84
WICKE, GEORGE, ESQ.....	38, 89
WILLOUGHBY, SAMUEL.....	123, 202
WILKINSON, SAMUEL.....	145
WILSON, MR. DANIEL.....	40
WINNING, HENRY.....	33
YOUNG, MR. JOHN.....	132







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